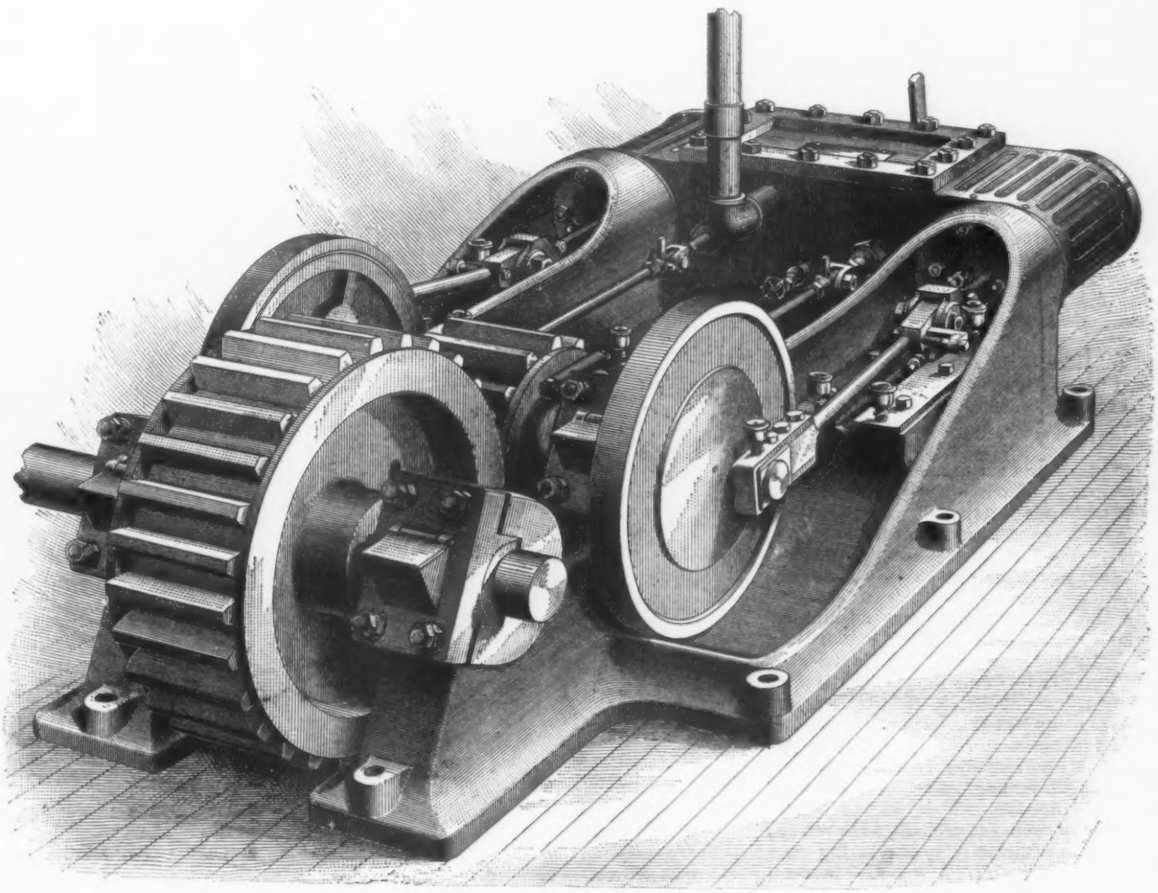
THE IRON AGE

THURSDAY, APRIL 6, 1893.

The Crane Reversing Engines.

For many purposes the, ordinarily, prerequisite quality of economical steam consumption by an engine becomes of secondary importance as compared with promptness of action and durability, under certain disadvantageous conditions, which would render the use of a high duty engine a source of continual inconvenience and expense. In rolling mills, for instance, there is usually a multiplicity of engines of comparatively small powers, which are necessarily subjected to what may be considered pretty hard usage—that is, their working parts are exposed to the abrasive action of the dust and grit, and they are roughly handled, being started, stopped and reversed at full load as suddenly as the reverse lever or throttle can be shifted. They cannot well have, and therefore should not require, the more careful treatment they might receive at the hands of a skilled engineer, as they must be operated by a cheaper class of labor. Engines of the reversing type in particular must be capable of bearing without injury these sudden changes of load and direction, and they must also be able to respond promptly to all manipulations of the controlling mechanism. There is probably no situation in which these qualities are more truly essential than where the engine is used direct for operating the transfer tables of a heavy rolling mill. From their proximity to the rolls they are necessarily exposed to the flying grit, cinder and scale from the latter, which cannot but cause abrasion and lost motion to an extent which must seriously affect the action of an engine of ordinary construction. The link motion, for instance (or some of its numerous modifications), is one of the most generally used and efficient devices for reversing gear, and under ordinary conditions may be considered as entirely satisfactory. But its construction and principle of operation are such that it must suffer very rapid deterioration under such exposure, and the result must be an amount of lost motion which will seriously distort the motion of the slide valves, and thereby affect the efficiency of the engine, to say nothing of the expense and inconvenience of the necessarily frequent repairs. Furthermore, as the engines are usually of small size in proportion to the power required to handle the tables and their load quickly they must run at a comparatively high rotative speed, which must be attained almost instantly after starting or reversal, and not gradually, as with engines for ordinary duties. This, of course, required them to be handled without changing the throttle, which is generally left wide open, and the starting and stopping accomplished by means of the reversing gear, with full boiler pressure on the back of the valves, which is manifestly very severe on the several bearings of the link motion, even were it possible to thoroughly protect them from the effects of their gritty surroundings.

In order to meet, rather than attempt to change, the conditions due to this trying duty, the Crane Elevator Company of Chicago have designed the type of engines illustrated in the cuts and drawings shown. The greatest simplicity of construction consistent with efficient action seems to have been attained; and, incidentally, their cheapness of cost and maintenance is a not unimportant feature. The engine is intended to conform to, and not govern, the type of transmitting mechanism between it and the tables; and therefore quite an extensive line of styles and sizes has been found necessary to adapt it to the various devices used in different mills. Two of these styles are shown in the perspective views. Their general features of design are clearly indicated. The two engines, having quartered cranks, are entirely self contained, and of a construction which insures sufficient strength and rigidity to enable them to develop their full power, without danger of springing, entirely independent of the foundation. In all cases, except of the largest sizes, the beds are formed of a single casting, as are also the housings of the vertical type. Likewise, the two cylinders are of one piece, being solidly connected by the interposed steam chest, common to both.



THE CRANE HORIZONTAL TWIN ENGINE.

Fig. 1 shows the plain horizontal twin engine in which the bed plate is extended to carry the bearings for the shaft of the second gear. Fig. 2 is a front view of the vertical engine, showing the pinion and second gear, with bearings for shaft of the latter cast solid with main bed plate. The drawings—Figs. 3 and 4—show the constructive features of the horizontal engine, size 6 x 8 inches, as furnished to the South Works of the Illinois Steel Company. From an external view of these engines,

they could not be recognized as being of the reversing type, owing to the entire absence of any visible reversing mechanism. There it but a single fixed eccentric for each cylinder, which, together with its strap and rod, constitutes the entire valve motion—obviously, of itself, for one direction only.

Referring to the sectional drawings, Figs. 5, 6 and 7, however, we find the main slide valves, *o*, *o'*, to be of peculiar construction, and, also, a central supplementary valve P, operated by the handlever shown in the perspective cuts. This latter constitutes the reversing device, or at least the operative portion of it. By means of the ports *a* and B', and passages *a* and B, the valve P changes the steam admission to the cylinders and also the exhaust, from passage *e* to cavity *i* of the main valve *o*, thereby reversing the two functions and consequently the direction of motion of the piston. To follow out the operation in detail, let us suppose the valve P to be adjusted by means of the hand lever so that its exhaust cavity *d*, Fig. 7, will connect ports B' and C. This will leave port *a'* and passage *a* open to the steam with which the steam chest is filled. By Fig. 5 we see that the passage *e* in the main valve *o'* establishes communication between *a* and cylinder port *c*, thereby admitting steam to the cylinder in front of piston, while at the same time the exhaust is taking place from opposite side of the latter, through port *c'*, cavity *i*, passage B, port B', valve cavity *d*, and thence through exhaust port C to the exhaust pipe.

If we now reverse the position of valve P, so that cavity *d* connects *a* and *c*, the steam will be admitted to valve *o'* through B' and B and the cavity *i*, which, instead of being the exhaust, becomes the admission connection; while the release is effected through the passages and connections which previously performed the function of admission, and, consequently, the motion of the piston is reversed. By adjusting the position of reversing valve P with relation to ports *a'* or B'—through whichever the admission is taking place—the regulation of speed is attained, and the valve therefore performs the additional function of throttle. Of course, under very light load, the width of opening will be so slight as to cause very considerable wire drawing, but this is of little importance from the fact that such conditions of load are exceptional or only for short intervals. It will be observed that the full area of the reversing valve is exposed to the steam pressure, which, in the larger sizes, would render it difficult to move by hand with a sufficiently quick acting device. For all such sizes the valve is covered by a simple balancing plate which is so proportioned as to leave only so much of the valve area exposed to unbalanced pressure as is necessary to keep it firmly seated and prevent leakage.

From the foregoing it is obvious that the essential qualities of reliable efficiency, quickness of action, simplicity of construction and durability against wear, regardless of external conditions, have been attained in an admirable degree; as, also, the cheapness of cost, as compared with that of the ordinary types of reversing engines. The handling of transfer tables is but one of the many purposes for which the engines are used. They are equally adapted to all duties of moderate powers in which reversing is necessary. For elevator service, using steam power direct, there are a large number now in use, and, in fact, it was for this especial duty that the engines were originally designed.

Americans are fond of believing that the big trees of California are the largest in the world. That this is not the case has often been shown, and a writer in *Science* has taken the pains to do so again. The highest of the big California trees is 325 feet high and has a circumference near the ground of 45 feet; another measures 321 feet in hight, has a girth of 90 feet and a diameter of about 30 feet. The Eucalyptus, or gum tree, of Australia, however, sometimes attains a hight of 400 feet and over; one which was cut recently at Cape Otway was 415 feet high and 15 feet in diameter near the ground; another had a girth of 69 feet at its base, at 12 feet from the ground it had a diameter of 14 feet, at 78 feet from the ground the diameter was 9 feet, at 144 feet it was 8 feet, and at 210 feet from the ground it was 5 feet. Some of these trees commence to branch at 300 feet from the ground. A peculiar characteristic of the Eucalyptus is that it grows very rapidly and yet has very hard and durable wood.

From the annual report of Sir Henry Blake, Governor of Jamaica, to the English Government on the state of trade in the Colony for the year 1891–92, we learn that the financial condition of the island was very satisfactory. Although the imports had fallen off to some extent, and the exports to the United States had decreased in value, owing to less demand in the orange and banana trade during the year, the island treasury shows a surplus of receipts over expenditure amounting to nearly $1,000,000. The total imports in 1891–92 were $8,447,472, and exports $8,266,060. No loans were raised during the year, and the public debt, which is fully secured on the revenue, is $7,296,420, the major part of which was incurred on account of railway purchase and extension and the construction of canals. Altogether, Jamaica appears to be in a flourishing condition. Her trade with the United States comprises 50.9 per cent. of the total exports. and 37.2 of the total imports.

Nickel steel forgings for an experimental 8-inch breech-loading rifle have been finished, and the manufacture of the gun will begin at once at the naval gun factory in Washington. Nickel steel has never been used in the manufacture of guns, and it is thought that the physical characteristics, such as increased elasticity and extraordinary elongation, render it specially adapted for guns subjected to high pressures with nitro powders. The forgings for this particular gun have 3.15 per cent. of nickel. The gun will be 304 1 2 inches long and will weigh 31,300 pounds.

The Cunard Steamship Company presented checks to the engineers and officers of the "Umbria" for their skill in mending her broken shaft at sea and bringing her into port last December. The subscriptions of the underwriters for the same purpose amounted to $6000.

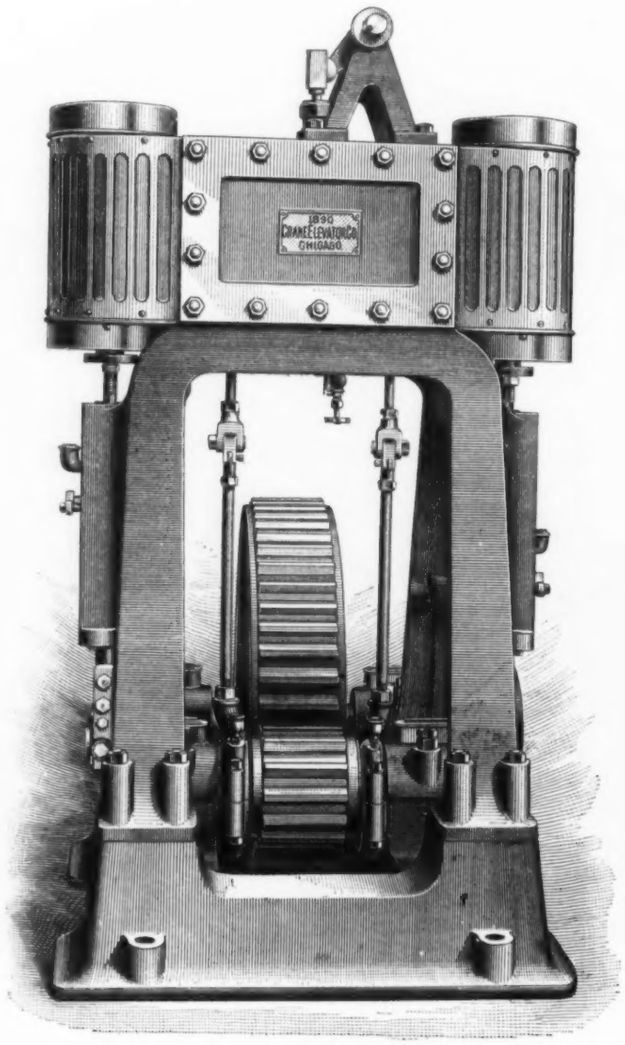


Fig. 2.

THE CRANE VERTICAL ENGINE.

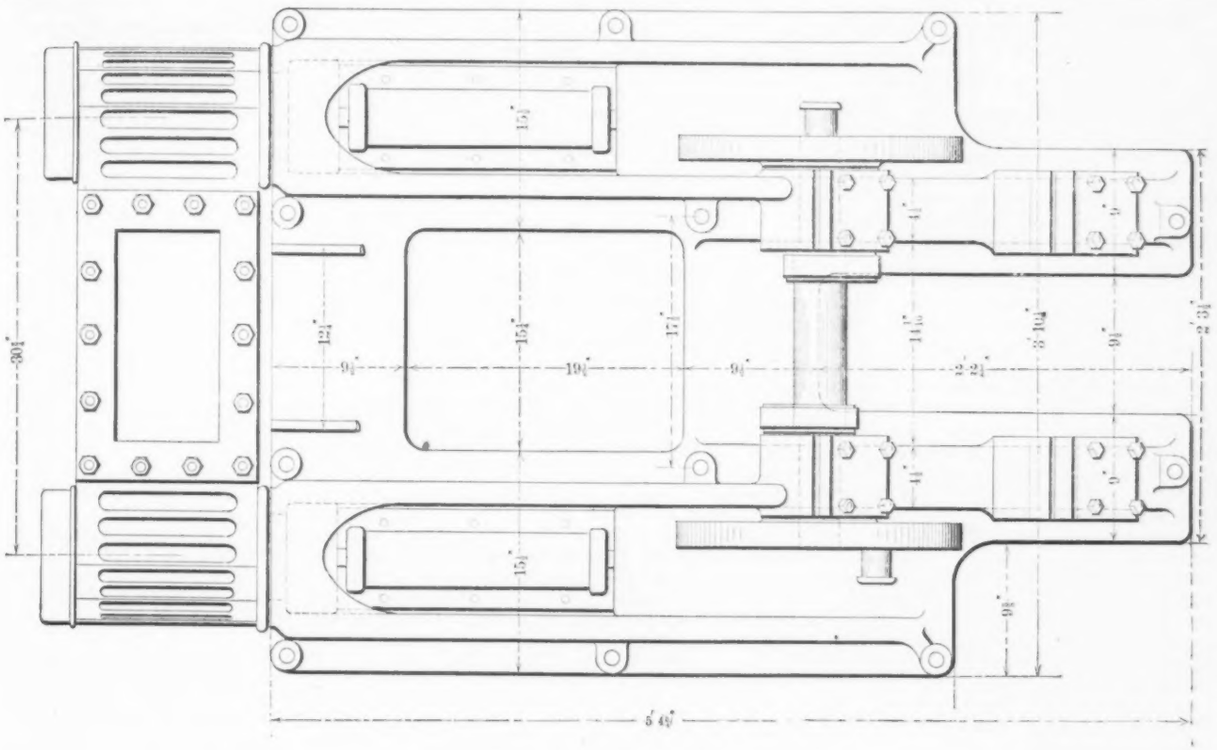


Fig. 3.—Plan View of Horizontal Engine.

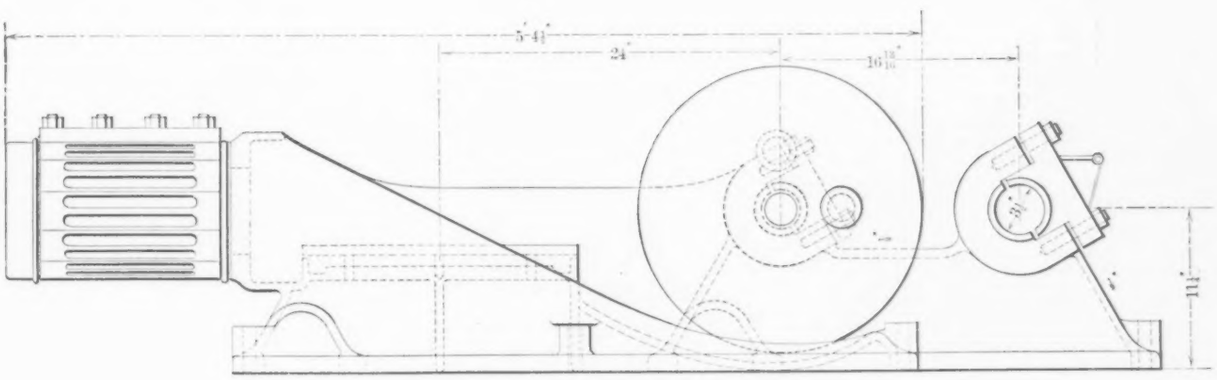


Fig. 4.—Side Elevation Horizontal Engine.

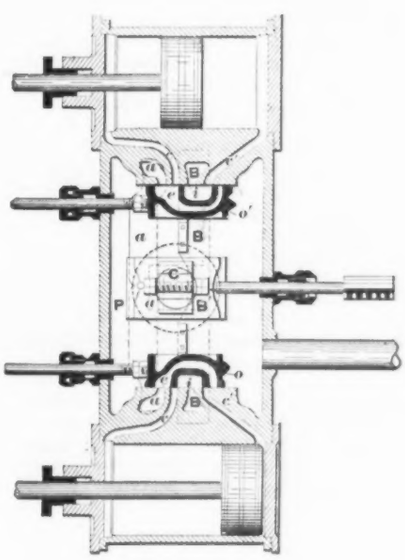


Fig. 5.—Horizontal Section on Line of Cylinder Axes.

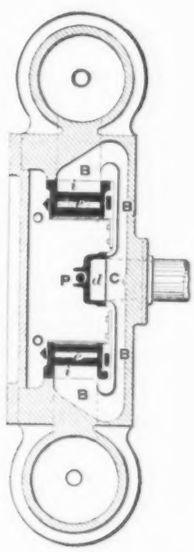


Fig. 6.—Vertical Transverse Section through Center of Port C.

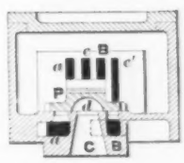


Fig. 7.—Vertical Section through Center of Reversing Valve.

THE CRANE REVERSING ENGINE.

WORLD'S FAIR NOTES.

Railroads Giving Bad Service.

With the opening day of the Fair less than a month distant every effort is being made by the officials to complete the work of preparation. The most serious delay now is caused by the unreasonable time taken by the railroads in delivering freight. The material for a large number of exhibits is kept by the railroads from ten days to two weeks when the distance hauled is only a few hundred miles. Even after the cars reach Chicago it generally takes four or five days to get them switched around. The Belt line, apparently, makes no effort to expedite the World's Fair cars. They lie on the side tracks for days, while exhibitors fume and fret at the chiefs of departments and the secretary of installation. Frequently exhibitors have brought a force of workmen from their home shops and the delay incurs a heavy loss to them, besides putting off the work that long. An aggravated instance of this kind last week came up in the installation office. The missing cars were traced finally to a side-track at Grand Crossing, less than two miles away, where they had lain a week without an effort having been made to get them to Jackson Park.

The material for the aquarium of the Pennsylvania Fish Commission has been over two weeks on the road. The officials are in Chicago waiting for the cars to arrive, but nothing can be heard from them. Cars over the Milwaukee & St. Paul have been two full weeks in reaching the park over the Belt line.

Although 200 cars a day are now being delivered at the fair the Transportation Department has had no trouble in handling the stuff as fast as it arrives, and the work is kept close up. The entire blame for the delays rests on the railroads, which handle exhibits the same as they would haul coal, and without the slightest apparent effort to get out of the rut. If the cars get side-tracked there they remain until the exhititors fill the offices with complaints.

Exposition Roofs All Repaired.

Rain now has no terrors for the World's Fair chiefs or the exhibitors, for the roofs are at last water-tight. The great task, which was ordered by Chief of Construction Burnham before leaving for New York a week ago, was practically completed last Wednesday. A regiment of workmen had been employed. On the day previous there were 800 in the roof force, and 400 of them freckled the vast expanse of the Manufactures Building. There are still some repairs to be made, but they are more to preserve the roofs than to stop leaks.

The cost of repairing the roofs is estimated at about $100,000. This figure is given by a contractor's superintendent, who has much to do with the repairs. A portion of this sum was due to the snow slides on the Manufactures Building and Machinery Hall, but by far the larger part is chargeable to poor material and poor workmanship. The material for some of the roofs did not cost over 50 per cent. of what it ought. The contractors, however, were not altogether at fault. Canvas roofing was something new to most of them, and, as the roofs were only to last until the close of the fair, they naturally selected light material. The winter was against them, and a heavy loss has resulted. A considerable portion of the roofing was done with corrugated iron or steel, and even this was not as well laid as it should have been, but had to be repaired.

All the repair work has been charged against the contractors, but where they have been paid in full the exposition may have difficulty in collecting from their bondsmen. The contracts provided only that the roofs be water-tight, and did not specify the material. Some of the contractors say they will not stand the cost of repairs made by the direct order of the exposition and will fight the case in the courts.

Instead of waiting for rain the repaired roofs have been tested by water from a hose, and have not been left until they were shown to be water-tight by resisting a downpour of rain.

Michigan's Exhibits.

In more ways than one the State of Michigan proposes to make itself known at the fair. Besides a building costing $50,000 it will have the only logging camp on the grounds, an exceptionally fine mineral exhibit, a grand horticultural show, and other conspicuous objects of interest. The State has been going along without saying much, but constantly making preparations for patronizing and supporting the exposition on a large scale. The Michigan board is the only State organization that has as yet opened an office on the grounds.

"In the Mineral Department, Mines Building," said Secretary Smith, "is where we expect to scoop the world. I have no hesitancy in predicting that when the doors are opened Michigan's exhibit there will attract as much attention and admiration as any other State or any other country on the globe."

The exhibit will be displayed in a pavilion made of stone, iron, ore, copper, crystallized salt, silver, gold, granite, marble, verde antique and other specimens of minerals taken from the quarries and mines of Michigan.

One of the unique attractions inside this pavilion will be a biblical representation of Lot's wife turned to a pillar of salt. There will also be a specimen of copper ore as it comes out of the mine, 98 per cent. pure and weighing 10,000 pounds. The cost of this pavilion is estimated at $20,000. It will stand in the center of the building opposite Germany and England, and is being constructed under the supervision of Peter White, member of the board for Marquette, and Jay A. Hubbell of Houghton.

The State has an outdoor space just south of Machinery Hall, where is being constructed a genuine logging camp 70 feet long and 20 feet wide. It will be an exact reproduction of the camps Michigan lumbermen live in, and the daily bill of fare, corn bread, pork and beans, strong black coffee, &c., will be the same as they have in the woods. Besides the camp there will be in this show the largest load of logs ever put on a sleigh and drawn by a single span of horses. These logs were cut and sent by Nester Bros. of Baraga, on the Sturgeon River. The load consisted of 50 pine logs, each 18 feet in length, piled in ten layers, varying in the number of logs from eight in the second layer to one capping the load. The biggest log contained 1225 feet, board measure, and the smallest 404 feet, and the whole weighed 300,000 pounds, or 150 tons. The logs were just cut, and were consequently heavy with sap and frost. They were loaded by means of chains and a pair of horses, with the assistance of three men. It took 1 ton of chain to bind the load together. The top of the last log was 33½ feet above the bottom of the runners of the sleigh. The horses weighed but 1700 pounds each and they pulled the load 80 rods on a level road to the rollway. The sleigh and team will be taken to the fair and the logs loaded again just as they were. It took ten standard size flat cars to transport the load to Chicago. The sleighs had 9 foot runners and 14 foot "bunks." That is, the width of the load was 14 feet. Near the camp will be a log train of five cars, and all about the place specimens of the tools used by lumbermen from the opening of the first camp in Michigan down to the present time.

Besides these State exhibits Michigan will be represented by about 1000 of its citizens with individual exhibits of manufactured goods and novelties, the products of their toil and genius.

From the Bay State.

Six carloads of the Massacbusetts State exhibit are now in Chicago. There is included in this shipment the entire mineral section of that State's exhibit and much of the old fashioned furniture with which the Massachusetts headquarters will be furnished.

Commissioner Hovey, who is at the head of the Bay State Commission, says Massachusetts' exhibit in the agricultural department will be especially fine and will embrace many interesting features. Most prominent in this section will be the displays from the State agricultural training schools and experimental farms. Especially noticeable will bethe educational section of the Massachusetts exhibit. Harvard University will make a magnificent display in this connection. The Massachusetts headquarters are now nearly completed. The building is a reproduction of the historic Hancock mansion and is among the finest of the State buildings.

Germany is Easily in the Lead.

Chicago papers say that it is at last possible to foretell where the honors of the exposition will go among the nations of the earth. Germany will be entitled to the first place among foreign exhibitors. The young Emperor's enthusiasm, spreading to his subjects, has produced the most magnificent exhibition of resources any nation has made outside of its own boundary lines. The beautiful structure, bearing the words "German Empire," has never been excelled as a national offering in a foreign land. It has been only since that structure neared completion that its beauty and imperial magnificence have come to be appreciated on the grounds. No one doubts that it is in Jackson Park to stay, for once the people of Chicago have seen it and roamed through its halls, public sentiment will not permit its destruction.

Mythology and metallurgy are a queer combination, but the pavilion now rapidly approaching completion in the Mines Building, which is to contain the exhibit of the great German iron works operated by the Barons Strumm, embraces in its details both of those sciences.

German mythology is illustrated by the devices with which the pavilion is decorated, and metallurgy is illustrated in every feature of the exhibit. The Strumm Brothers operate a plant that requires the employment of 5000 men. They are among the most advanced of the world's great iron manufacturers, and their display fully typifies the wonders that may be worked out of that base metal.

This structure will be 46 feet high and will occupy a floor space of 37 x 108 feet. The rear walls are of masonry, but the front elevation will be composed of heavy iron and steel manufactures of every conceivable device. Various German legends are being worked out in the design, merchant shapes forming the decorative material. A great portal in the center will give access to the pavilion. Over the entrance will be this inscription: "Vereinigte Eisenwerke Gebrueder Strumm, Nuenkirchen und Rudolph Boecking, Hallberger Huette." This will be worked out in mosaics with cinder and slag. Over this device will be the word "Strumm," also fashioned in the same manner. Iron and steel beams of different shapes will form the side columns of the portal, and surmounting the lettering will stand, upon a scroll of intricate design, a life-sized mythological figure of hammered copper.

The scroll is made of manufactured iron pipes such as are turned out by the carload every day at the Strumm works.

At each of the four corners of the exhibit will be placed a large obelisk formed of T rails, round, angle and flat bars and various other products of the Strumm Mills grouped in artistic designs. These pyramids are 50 feet high. The two nearest the entrance are composed of transverse sections of beam iron. The trophies in the rear are of the same hight as those of the front elevation. The one on the right is composed of pipe iron, while that on the left is formed of band and strap iron, having the form of a gigantic flower stock, and fastened together at the base by hoops and coils of wire of various circumferences.

The rear of the pavilion is formed of solid masonry, and the front will be inclosed with a post and chain railing. The posts are samples of the results that may be obtained in iron and steel decorations. The head of each post consists of some familiar mythological god or goddess wrought in iron and steel, while the foundations are composed of manufactured articles of the same material.

The rear wall will be covered with photographs of the mammoth works of the Strumms, and there will be displayed the history of the concern since it was founded. The art of iron working has been brought to its highest development by this firm and their entire display is calculated to illustrate the achievements accomplished in that branch of industry in the past decade.

One of the most interesting parts of the exhibit is the immense iron rail which will form a portion of the frieze in the rear of the pavilion. This rail is 200 feet long and is bent in the form of a scroll, having been bent cold.

All along the front of the exhibit excellent paintings in oil are hung representing the various buildings and departments of the works. The visitor will also find there statistical references, such as the number of workmen employed in each division, the annual production, and the benevolent institutions for disabled and sick employees and their families, &c. Solid obelisks, 30 feet high, connected by scrolls of solid steel and cast iron, surround the interior of the mammoth exhibit.

Herr Mayer, who superintends the construction of the pavilion, is a young man who has secured a position of responsibility in the great establishment. He is a graduate of the Saarbruecken Gymnasium. He served a year in the Garde-Fuesilier Regiment. He also completed a course in the Royal Technical School of Saarbruecken.

From New South Wales.

One of the most interesting displays that will be seen within the great structure devoted to mines and mining will be that now being prepared by the representatives of New South Wales. The work of installation is being superintended by J. E. Carne, F. G. S., of the Department of Mines, of Sydney. Speaking of the display yesterday, Mr. Carne said:

"It will undoubtedly surprise the American public to learn that in point of value gold does not rank first among the minerals of New South Wales. Coal will be made a feature of this exhibit, and it deserves the honor, because it is our most valuable mineral. The order of the output of the minerals of the colony is coal, gold, tin and copper.

"As a whole this exhibit may be said to be a heroic display of base metals. Along the front line will be massive trophies of silver ore, tin, copper and antimony. One particularly interesting feature will be the silver monument, which is to be erected at the northeast corner of the exibit space. It will represent one-sixth of the entire output of the great Broken Hill Mine, which from May, 1886, to May, 1892, produced 36,500,000 ounces of silver and 156,000 tons of lead.

"In the rear there will be a triple arch, with two center pillars of coal and two outer pillars of petroleum oil coal, which is locally known as kerosene shale. These pillars will be 4 feet square and 11 feet high. Behind this feature will be shown full sections of principal coal scenes.

"That portion of the display which will be first seen by the visitors will be made up of bulk trophies of gold, siver, copper, tin, antimony, iron, manganese and chrome and building stone. These will be made as attractive as possible. Then there will be show cases containing collections of all metallic and non metallic minerals. In these collections will be some of the most valuable specimens ever discovered. Quartz and placer gold and gems will be displayed as a distinct feature. And then there will be collections of fossils from the principal sedimentary formation. These will be accompanied by geological maps that will give one a comprehensive understanding of the physical formation of the colony."

The Great Waterbury Clock.

A few days ago the story was cabled to America that England would set up within the Manufactures Building a clock that would tell the time o' day in more ways than any other clock ever constructed. But when the makers come to install that feature they will find, anomalous as it may seem, that they are way behind the times. In the center of the big building will be displayed a mammoth clock that will chime the time for all, built by the Waterbury Clock Company, that in the diversisy of its accomplishments will be to the English clock as an hour is to a minute.

It was the original intention of the Waterbury Company to complete its clock so that it might be placed on exhibition at the Paris Exposition in 1889, but the scope of the undertaking assumed greater proportions as the work progressed, and it has been completed only a few weeks.

The timepiece stands 16 feet in hight, with a 6 foot base. It is made of black walnut, highly polished and handsomely carved with scenes representing American history from the landing of Columbus to the present time. At the lower part of the clock and on each side is an allegorical scene representing mechanical progress during the last century, every figure in each group being in motion.

The largest scene is in the center of the clock. It represents the "train room" of the Waterbury Clock Company, with all the shafting and machinery in operation and 25 operatives at work. The figures go through every motion of work in that department.

Four scenes are represented on the sides of the clock. The subjects are, first, a cotton gin in full operation in a cotton field, with the negroes carrying the cotton in from the fields and placing it on the cotton gin, while Eli Whitney, who stands by, is explaining the working of the machinery to a planter. A second scene shows the old method of manufacturing cloth. The operatives are at work beating the flax and preparing it for the looms and spinning wheels. A third scene represents a coal mine with the cage working and the miners digging into the banks of coal.

In a fourth scene is a representation of the improvement in sewing machines. Elias Howe is watching the work of one of his machines, while close by modern machines are plying, and in another adjacent group are a number of women laboriously sewing by hand. The fifth group indicates the advance in the electrical world. Electrician Daft is represented operating a dynamo. The sixth shows the interior of a telephone and telegraph office with operators at work and messenger boys running in and out.

Scene seven contrasts the old and new methods of manufacturing watches, showing the improved factories of the present day and a kitchen in Switzerland where watches were made by hand a century ago. The last is an old-fashioned saw-mill with the saw running, logs moving, and children playing near by.

The figures are all operated by an electric motor and are constantly in motion. The center of the clock is occupied by a beautiful water color of the buildings of the clock company, while just above is the handsome dial of the clock. It is 3 feet in diameter and indicates the days of the week, month, and year, the hours, minutes, and seconds of the day, and the moon's phases and tides. Each figure represented is an exact likeness, and the whole is complete in every respect. At the top of the clock is a handsome carving of the "Declaration of Independence" with a reproduction of the famous old Liberty bell.

Will Light Chicago Harbor.

During the exposition season seven miles of the Lake Michigan front will be lighted by means of electric buoys. This is to be a feature of the fair, and will form a part of the Government exhibit.

Capt. W. S. Schley, U. S. N., who is now in charge of the Third Light House District, the headquarters of which is at Tompkinsville, Staten Island, arrived in Chicago last week. He will have charge of the work of arranging the line of buoys, and will superintend the greatest electrical experiment ever undertaken in any country.

If Captain Schley is successful harbor navigation will be revolutionized. The current for the lights will be furnished from one station. A power station will be erected at one end of the line and one cable laid the entire distance they propose to light. The wire will be of very small caliber at the dynamo, and taper up to about an inch at the return end. It will be made in this manner to save any loss of the current by friction. It is proposed to send 1500 volts over the entire line from one station, and a sufficient current will be taken off by means of a converter to supply each individual light. Fourteen miles of cable have been received, and will be used to complete the return circuit. The cost of the experiment will be about $25,000. To light the harbor by the old system would cost ten times that amount.

A Pavilion of Solid Mahogany.

One of the most magnificent and unique pavilions being constructed within the Manufactures Building is that which will house the exhibit of the Meriden Britannia Company. This pavilion is little more than 20 feet square, and yet will cost about $40,000. It is being constructed of solid mahogany and plate glass. It fronts on Columbian avenue, opposite the pavilon being erected by Germany. If the exhibit is worthy of the pavilion it will certainly be the finest of its line in the department.

A new method of securing cheap electric light from refuse has been exploited in England. A company has been formed in London, under the name of the Refuse Disposal Company, with the object of handling the dust refuse of cities and utilizing it, through the medium of destructors of their own design for electric lighting purposes. It is claimed that 20,000 tons of house dust, treated according to their system, may be made to produce as much as 5,600,000 indicated horse-power.

The Westward Movement of the Center of Population.

In his speech at Pittsfield, Mass., Senator Dawes made pointed reference to the marvelous growth which the Western section of the United States has achieved since his entrance on public life. "The country," he said, "has been widening and going westward and westward to the Pacific Coast, and then on beyond, until the latitude itself fails to chronicle our onward march, and westward falls into the eastward, so that the sun will not go down to night upon our westward border until it shall have risen on the coast of Maine." The continuousness of this growth is shown by the steady westward movement of the center of population. When the census of 1850 was taken, two years after Mr. Dawes' public career began, the center of population was located at a point 23 miles southeast of Parkersburg, W. Va. The census of 1890 puts the point 20 miles east of Columbus, Ind. Here is a westward movement of 229 miles in 40 years, giving an average rate of 5.72 miles per year.

If the measurement is carried 60 years further back, to the first census of 1790, we find that there has been in the 100 years a movement westward of 505 miles, the center of population having passed from a point 23 miles east of Baltimore, Md., to the location in Indiana noted above. The rate of progress for the whole period averages 5.05 miles a year, or 73 feet a day. In other words, for a century the center has been moving westward at an average rate of 1 yard an hour, with 1 foot thrown in every 24 hours for good measurement. The slowest progress was made in the second decade, from 1800 to 1810. In this period the population center achieved only 36 miles of westing, or at the rate of about 2 feet 2 inches per hour. The swiftest progress came in the seventh decade, from 1850 to 1860, when the center moved westward no less than 81 miles, or at the rate of about 4 feet 10 inches per hour. During the last decade of the census enumeration, from 1880 to 1890, the rate dropped a little below the average, 48 miles of westing being made, which would be about 2 feet 11 inches per hour. We may add, to bring the estimate down to the beginning of 1893, that, if the rate of progress noted in the past census decade has been maintained in the two and one half years since the census was taken, the present center is found at a point 8 miles east of Columbus, Ind., about half way between that city and Waynesburg. And the census of 1890 will, at the same ratio, bring it to a point nearly 2 miles south of Unionville, Ind.

It is a curious fact that while the westward movement of the population has covered no less than 9¼ degrees of longitude (9 degrees 21 minutes 7 seconds), this movement has run almost in a straight line, the extreme northern and southern variations embracing less than one-third of a degree of latitude (18 minutes 56 seconds). To put the contrast more distinctly, we may say that while the western movement for the century aggregates 505 miles, the extreme northern and southern variation is a little under 22 miles, and the finishing point of the line is only some 6 miles south of the starting point. The slightness of this variation may be taken as showing that if you divide the United States by the thirty-ninth parallel of north latitude the growth of the population in the two sections thus made has been very nearly equal during the 100 years covered by the 11 censuses. In view of the fact that the tide of immigration from foreign countries has set mainly into the northern section, such an equality in the growth of the population is a development that would hardly have been looked for.

The bronze monument to be dedicated to the memory of John Ericsson of monitor fame will be unveiled at the Battery before the end of April. The statue is of standard bronze, 8 feet 3 inches high and weighs 1500 pounds. It was taken from a clay model by J. Scott Hartley. Frank E. Wallis is the architect of the pedestal, which will be 9 feet high, and made of Quincy granite, with polished panels 27 x 12 inches each. The lower part of the pedestal will be of rough, unpolished granite. The inventor is represented standing dressed in the regulation frock coat, with a drawing scroll in his left hand and draftman's compass in his right.

The Premier Steel Company.

The plant of the Premier Steel Company of Indianapolis now embraces the following: In the Bessemer department there are three cupolas with a combined melting capacity of 500 tons of metal per day of 24 hours; two 6 ton converting vessels, eight soaking pits, each capable of holding four of the largest ingots; two blowing engines, manufactured by Mackintosh, Hemphill & Co.; one 32-inch two-high blooming mill, manufactured by the same parties, with 175 feet of table, and a powerful shear with a capacity of shearing 12 x 12 inches, or slabs 20 inches wide. The steam is furnished for this machinery by 12 tubular steam boilers, 175 horse power each. All this machinery is contained in a steel and iron building 350 feet long by 60 feet wide in the blooming mill department and 100 feet wide in the Bessemer department. Adjoining that building is the open-hearth department with two Siemens-Martin furnaces 15 tons each, equipped in the most modern style.

Adjoining the shear end of the blooming mill, and extending westward, is the architectural steel rolling mill—a brick structure, 400 x 300 feet. In this mill is a 26 inch three high train, driven by a Porter-Allen 2000 horse-power engine, with the necessary complement of boilers, pumps, &c. This mill was originally built for a rail mill, and all its equipments have been so preserved that it would need but a few days to go on to rails. On this train, at present, there are being rolled steel I-beams, channels, &c. This particular mill is also equipped to roll wide slabs up to 28 inches of any thickness. In the large mill formerly used for rolling iron rails and muck bar are now being placed one 18 inch and one 12-inch train, on which sheet bars, flats, rounds and squares of all sizes will be made.

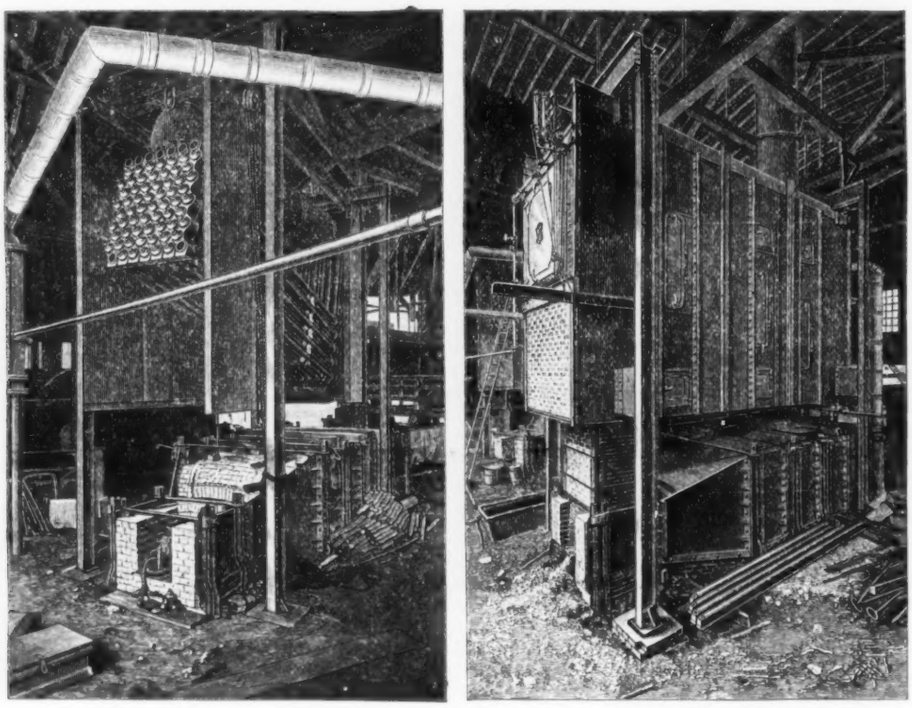


Fig. 1.—Babcock & Wilcox Boiler Over Puddling Furnace at Pennsylvania Bolt & Nut Company, Lebanon, Pa.

The principal product of the works consists of billets, sheet bars, slabs and architectural steel of all kinds. The plant has a well-equipped machine shop and foundry, making all its own rolls, molds, &c. The company own about 20 acres, and have their own railroad, connecting it with the union tracks, so that they have no switching charges whatever. The principal trade for the product of the mill is in the West and Northwest. The officers of the company are: C. W. DePauw, president; N. T. DePauw, vice-president; Albert Trinler, treasurer, and W. H. Coen, secretary and general manager.

A decision is pending in the United States Supreme Court in the infringement case of the Union Switch & Signal Company of Pittsburgh against the Johnson Railroad Signal Company of New Jersey. Last week arguments were made in the case, and a decision is expected at an early date. The matter came up from the New Jersey Court, where the bill of complaint of the Union Switch & Signal Company for an alleged infringement by the Johnson Company on patented improvements on railroad signals was sustained.

Babcock & Wilcox Boilers Over Puddling and Heating Furnaces.

Rolling-mill managers have long appreciated the serious drawbacks incident to the use of two flue and cylinder boilers as a means of at least partially utilizing the waste heat of puddling and heating furnaces. The intense and fluctuating heats of the furnace, particularly in the case of the puddling furnace, have a very serious influence upon the life of the boilers, leading generally to heavy repairs, and occasionally to disastrous explosions. To some extent also the addition of boilers to the furnace plant influence adversely the operations conducted in the furnace itself. This suggested, even in the early development of the water-tube boiler, its employment for this purpose. The first attempt to use them was made by the McCullough Iron Works of Wilmington, Del., who, in 1874, put some Babcock & Wilcox boilers over puddling furnaces in their Wilmington mills. These boilers, erected 17 years ago, have been in constant use ever since, have given entire satisfaction, and have required practically no repairs. Since 1874 the McCullough Iron Company have placed orders for these boilers, aggregating 1200 or 1500 horse-power, with the Babcock & Wilcox Company, and have found that the boilers universally give satisfaction.

The Catasauqua Mfg. Company began using this boiler for puddling furnaces in 1881. In 1882 the American Sheet Iron Works and the Delaware Rolling Mill of Phillipsburg, N. J., put some of these boilers in for the same purpose. The latter part of the same year the McDaniel & Harvey Company of Philadelphia adopted them. In 1885 the Troy Iron & Steel Company of Troy, N. Y., put some of them in on trial, and have added from time to time since then until they have now nearly 2000 horse-power of these boilers utilizing waste heat at their works.

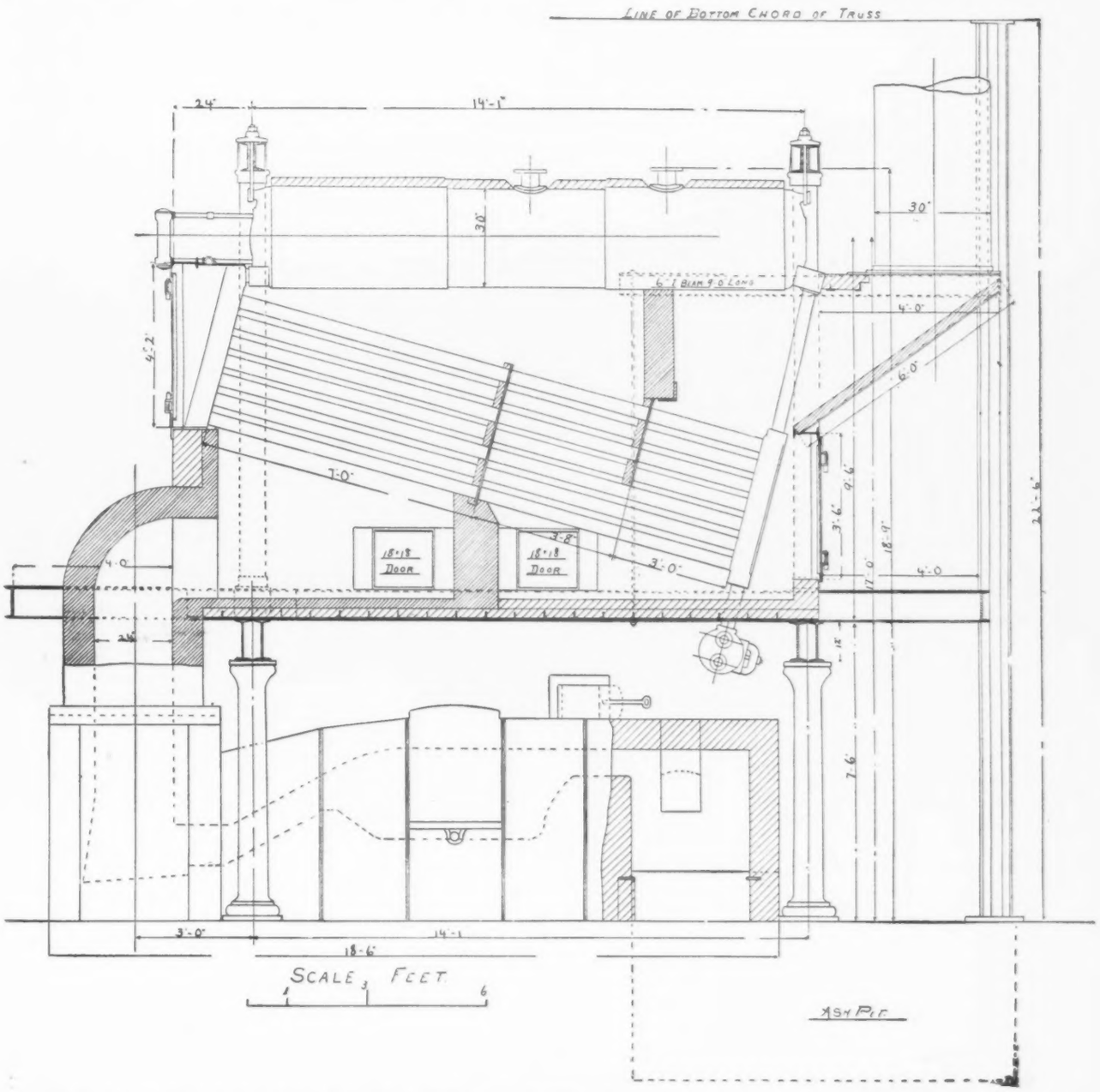


Fig. 2.—Longitudinal Section Babcock & Wilcox Boiler Over Puddling Furnace.—Oliver Iron & Steel Company, Pittsburgh.

The design developed in the experience gathered in the use of the Babcock & Wilcox boiler is shown in the accompanying engravings, Fig. 1 illustrating the appliance as put in at the works of the Pennsylvania Bolt & Nut Company, Lebanon, Pa., where the method of suspending the boiler from four upright columns is very clearly shown. Fig. 2 is a longitudinal section of the Babcock & Wilcox boiler, as put in at the Oliver Iron & Steel Company, Pitts-

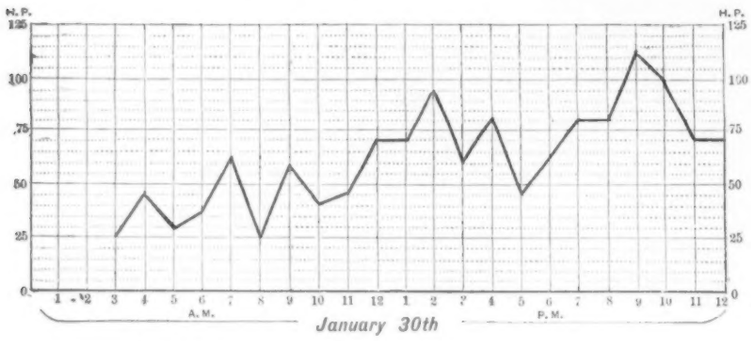
burgh, Pa. There are two of these boilers, each one entirely separate and distinct from the other, each boiler having its own stack, the battery spanning two puddling furnaces.

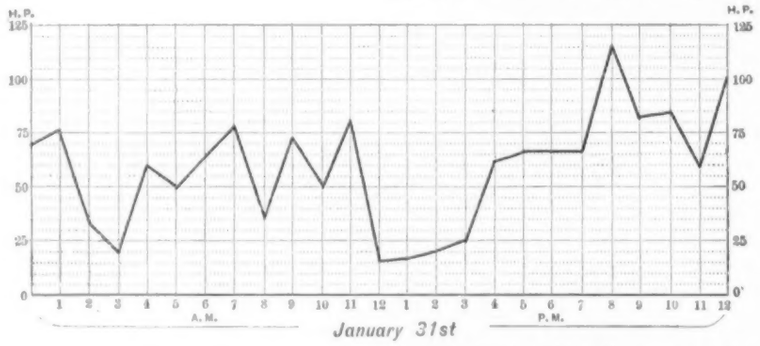
The construction of the boiler and setting is as follows:

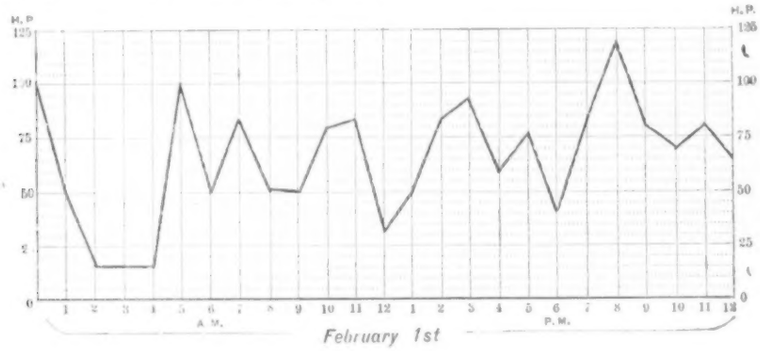
Four cast iron columns are erected on brick or stone piers at the sides of the puddling furnaces, spaced so as not to interfere with the working of the furnace. Two pairs of 12-inch I-beams are thrown across and clear of the furnaces, each pair resting upon two of the columns. Upon these 12 inch beams six 9 inch I beams are laid lengthwise of the furnace. These support the side and end walls of the brick setting, and by their bottom flanges support 2½ x 2½ inch T's laid between and at right angles to them, the T's being one brick's length apart and affording support for a fire-brick floor laid between and over them.

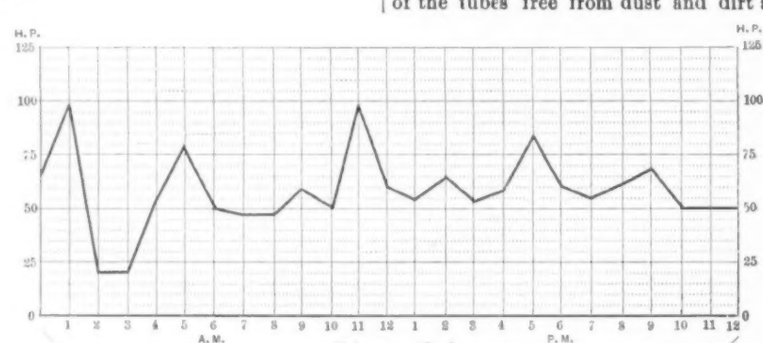
This type of boiler is suspended from an iron frame work and does not depend upon the brick work in any way for its support. To this end there are erected four vertical I-beams, two front and two rear, resting upon the longitudinal 9-inch beams directly over the ends of the transverse 12-inch beams. Across these vertical beams rest two pairs of channels, each pair secured at both ends by cast-iron boxes. From these channels are suspended two 30-inch steam and water drums, 14 feet long. From each of these steam and water drums are suspended four sections, each containing seven 4-inch wrought-iron tubes, 14 feet long, these connected with the steam and water drum overhead, front and rear, by 4-inch wrought iron tubes. All the tubes and nipples are made of the best charcoal iron. From the bottom of the rear ends of these sections in each boiler is suspended a mud drum 12 inches in diameter the full length of the width of each boiler. Each section of the tubes has a separate nipple connecting it with the mud drum direct. All the tube joints are expanded with a Dudgeon expander into finished tapered holes, and, the pressure being from the inside, the higher the pressure the tighter the joints will be. The pressure parts of the boiler being erected, the side and end walls are built up around them, the stack is placed upon its support, the cleaning doors and fittings, all of standard design and weight, are placed in position, and the boiler stands ready for firing. Boilers for this purpose are built to stand a working pressure of 150 pounds to the square inch and range from 90 to 416 horse power, depending upon the size of the puddling or heating furnaces to which they are to be attached. The drums are made of $\frac{5}{16}$-inch open-hearth flange steel. It will be noticed by referring to Fig. 2 that the front part of the boiler is at the rear part of the puddling furnace. This makes the front part of the puddling furnace the coolest part of the boiler, as the gases are ready to be discharged into the stack on reaching that part of the setting around which the puddlers work. This is a great advantage, as with the two flue boilers the heat given off by the boiler has been such as to seriously inconvenience the puddlers at their work.

Ample facilities for keeping the exterior of the tubes free from dust and dirt are provided by large cleaning doors let into the side walls of the boiler, through which the steam jet is introduced, and the ac-









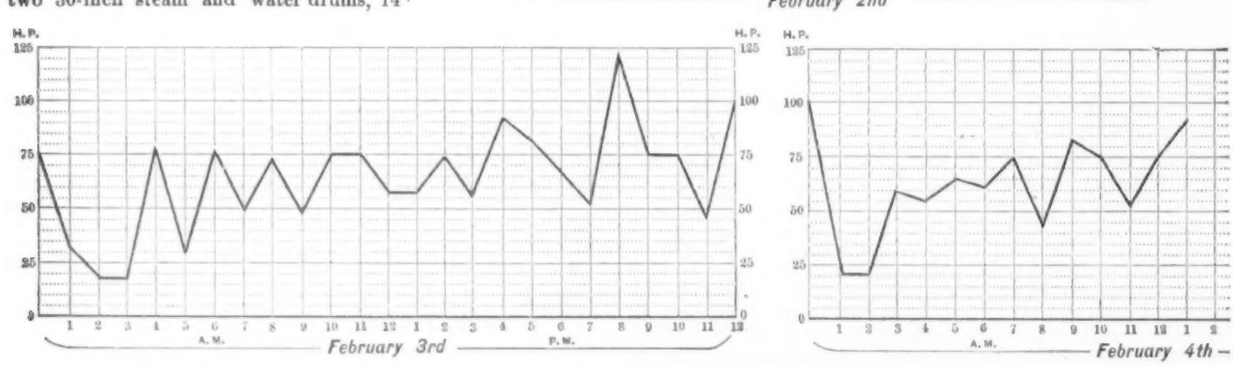


Fig. 4 to 9.—Hourly Fluctuations in Horse-Power of Babcock & Wilcox Boilers Over Puddling Furnace at the Pennsylvania Bolt & Nut Company, Lebanon, Pa.

cumulations removed by its use are taken our periodically through other cleaning doors placed in the side walls near the floor. The same easy means of access to the interior of both tubes and drums are provided as are found in the ordinary type of this boiler, and platforms, 4 feet wide, front and rear, give ample standing room for men engaged in cleaning, inspection or repairs.

The following table presents a summary of a series of tests made at different times at the different mills enumerated:

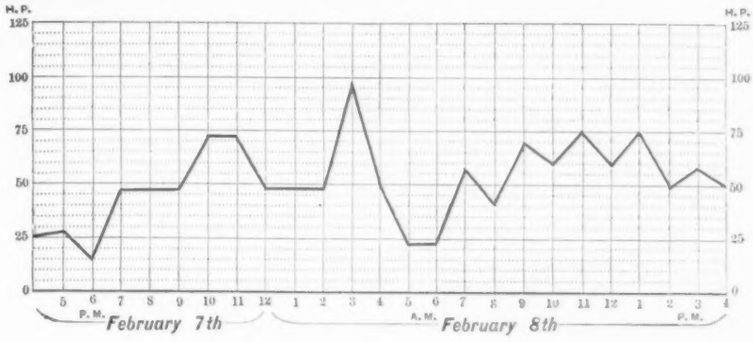


Fig. 10.—Fluctuations of Horse-Power of Cylinder Boiler Over Puddling Furnace.

eter and 18 feet long, 6 sections wide and 9 tubes high, drums 36 inches diameter and 18 feet 6 inches long; and one cylinder boiler 42 inches diameter and 26 feet long. Both boilers supplied by the waste gases from puddle furnaces. The coal burned on the puddle grate under the B. & W. boiler included that used in heating the furnace and banking fires.

We quote as follows the report of Wm. D. Hoxie on the test made:

"When looking over the results of a test of a boiler situated over a puddle furnace the reader should bear in mind the fact that the boiler is operated by waste gases, the coal being burned in order to puddle the iron, the boiler taking up that amount of heat in the waste gases that would, without its intervention, escape up the stack.

"In order to obtain a complete record of the coal consumption, water evaporated and iron puddled, it was decided to make a test for one week, which was the period that the puddle furnace was in continuous use.

"The operation of heating the furnace was commenced at 12.05 a.m., January 30, 1893, and at 3 a.m. the steam pressure in the boiler had reached 60 pounds, and the boiler was cut into the main steam line, the hight of the water in the glass being noted at the same time. At 4 a.m. the furnace was considered hot enough to take the average charge of 1150 pounds of p'g iron.

"Scales which had been previously standardized were used to weigh both water and coal. A tank that would hold 1500 pounds net of water was operated on one scale, and the time that its contents were pumped into the boiler was carefully noted, the hight of water in the glass being kept at nearly a constant level. This afterward proved useful, as it enabled the horse-power to be ascertained at every hour during the run, thus forming a chart showing its fluctuations, due to the great range of temperature to which the puddle furnace is subjected.

"Samples of coal were weighed out from time to time in order to obtain the amount of moisture contained, which was found to average 6.7 per cent. This high

Summary of Tests Made Upon Boilers Generating Steam by Means of Waste Gases From Puddle and Heating Furnaces.

		Conductor of Test.
No. 1.	One B. & W. boiler over a puddling furnace	D. Ashworth.
No. 2.	One B. & W. boiler over a scrapping furnace	Geo. A. Rowell.
No. 3.	One B. & W. boiler over a puddling furnace	Geo. A. Rowell.
No. 4.	One B. & W. boiler over a puddling furnace, 1.34 pounds of iron puddled per pound of coal	D. Ashworth.
No. 5.	One B. & W. boiler over a puddling furnace, 1.38 pounds of iron puddled per pound of coal	W. D. Hoxie.
No. 6.	One cylinder boiler, 42 inches diameter, 26 feet long, over puddling furnace, 1.14 pounds of iron puddled per pound of coal	W. D. Hoxie.
No. 7.	One B. & W. boiler over a heating furnace	W. D. Hoxie.

Data of Test.	Oliver Iron & Steel Company, Pittsburgh.	Union Rolling Mill, Cleveland.		W. D. Wood & Co., Pittsburgh.	Pennsylvania Bolt & Nut Company, Lebanon, Pa.		
	Test No. 1. Oct. 23, 1891.	Test No. 2. April 18, 1892.	Test No. 3. April 19, 1892	Test No. 4. Oct. 4, 1892.	Test No. 5. Jan. 31-Feb. 5, 1893.	Test No. 6. Feb. 7-Feb. 8, 1893.	Test No. 7. Feb. 9, 1893.
Heating surface per horse-power, square feet	9.2	10.7	10	11.2	19 11	2 72	15 58
Grate surface per horse-power, square feet	0.17			0.21	0.217	0.258	0.18
Coal burned per horse-power, pounds	5.4			5.1	5.53	9 16	4.7
Heating surface, square feet	1,026	841	513	513	1,196	143	1,380
Grate surface, square feet	19.83			9.7	13.6	13.6	16⅔
Ratio of heating to grate surface, square feet	52			52.8	87.2	10.5	82.8
Kind of fuel used	Bitu. Slack	Bituminous	Bituminous	Bituminous	Bituminous	Bituminous	Bituminous
Duration of test, hours	8	2	3½	8	130	24	12
Average steam pressure, pounds	102	68	69.3	123	58.2	63	57.4
Average temperature of feed water entering boiler, degrees	150	52	53	143	124.5	123.6	142
Pounds of coal burned	48.69			1,865	45,007	11 551	4,993
Pounds of refuse					6,038	1,464	598
Pounds of combustible					38,969	10,087	4,395
Per cent. of ash					11	12.6	12
Coal burned per square foot grate per hour, pounds	30.7			24 3	25.45	35.38	24.96
Total water evaporated at temperature of feed, pounds	28,864	4,493	4,930	11,250	250,503	38,739	33,285
Water evaporated per hour, pounds	3,358	2,342	1,772	1,406.2	2,159.3	1,812.6	3,054.8
Water evaporated per square foot heating surface per hour, pounds	3.27	3 2	3.45	2.74	1.8	12.67	2.11
Water evaporated per pound coal—actual conditions, pounds	5.6			6.3	5.565	3.35	6.66
Water evaporated per pound coal, from and at 212°, pounds	5.9			6.75	6 226	3.76	7.341
Water evaporated per pound combustible—ctual conditions, pounds					6.428	3.84	7.568
Water evaporated per pound combustible, from and at 212°, pounds					7.203	4.31	8.339
Quality of steam by Heisler calorimeter, per cent					1.95	2.23	2.4
Rated horse-power	90	73	50	45	104		120
Horse-power developed (horse-power equals 30 pounds water evaporated per hour from feed at 100° and 70 pounds pressure)	111.3	78	51.4	45 64	62 58 For 120 hours	52.54	88.54
Per cent. above rated capacity	24	6 9	2.76	1.4	67.80		0.74 of cap.
Temperature of boiler room, degrees					57	50	52
Temperature of flue gases, degrees	493	600	600		525	1000-2500	400
Force of draft in inches of water	0.3			0.15	0 31	In ash pit, .75	In ash pit, .8

Particular interest attached to the tests Nos. 5 and 6, made at the Pennsylvania Bolt & Nut Company, to show the relative efficiency of a Babcock & Wilcox boiler and of a cylinder boiler at the same mill.

One Babcock & Wilcox water-tube boiler, containing 54 tubes 4 inches diam-

figure was accounted for by the coal being exposed to heavy rain and snow storms.

"The coal consisted of a mixture containing about 75 per cent. of Cross Creek, the remaining 25 per cent. being made up of Beech Creek and Pennsylvania Clearfield.

"Observations every half hour were

taken of the thermometer and manometer of the Heisler calorimeter, the average results of which are here appended:

January 30, 1893. Per cent. of moisture in steam	1.8
January 31, 1893. Per cent. of moisture in steam	2.12
February 1, 1893. Per cent. of moisture in steam	1.9
February 2, 1893. Per cent. of moisture in steam	1.95
February 3, 1893. Per cent. of moisture in steam	1.75
February 4, 1893. Per cent. of moisture in steam	2.15
Average for run	1.95

used, including that used in heating the furnace and banking the fires, the latter of which was done for a period of from one to three hours, during the shifts of the day and night turns. This occurred between 12 and 4 a.m. each day and its effect is shown by the continuous depression of the curve corresponding to that time of day on the horse-power chart.

"The quality of the coal was the same in both tests.

"The total number of pounds of finished iron produced from the furnace under the B. & W. boiler during the is far in excess of what the heating surface could absorb, which is shown by the temperature of the escaping flue gases, ranging from 1000° to 2500°.

"The economy of the two boilers is illustrated by a comparison of the pounds of coal required to produce a horse power. In the B. & W. boiler this amounted to 5.53 pounds, while 9.16 pounds were necessary in the cylinder boiler.

"Deducting ten hours for banking fires, during which time the B & W. boiler was practically at rest, we have 67.8 horse power as an average for the remaining 120

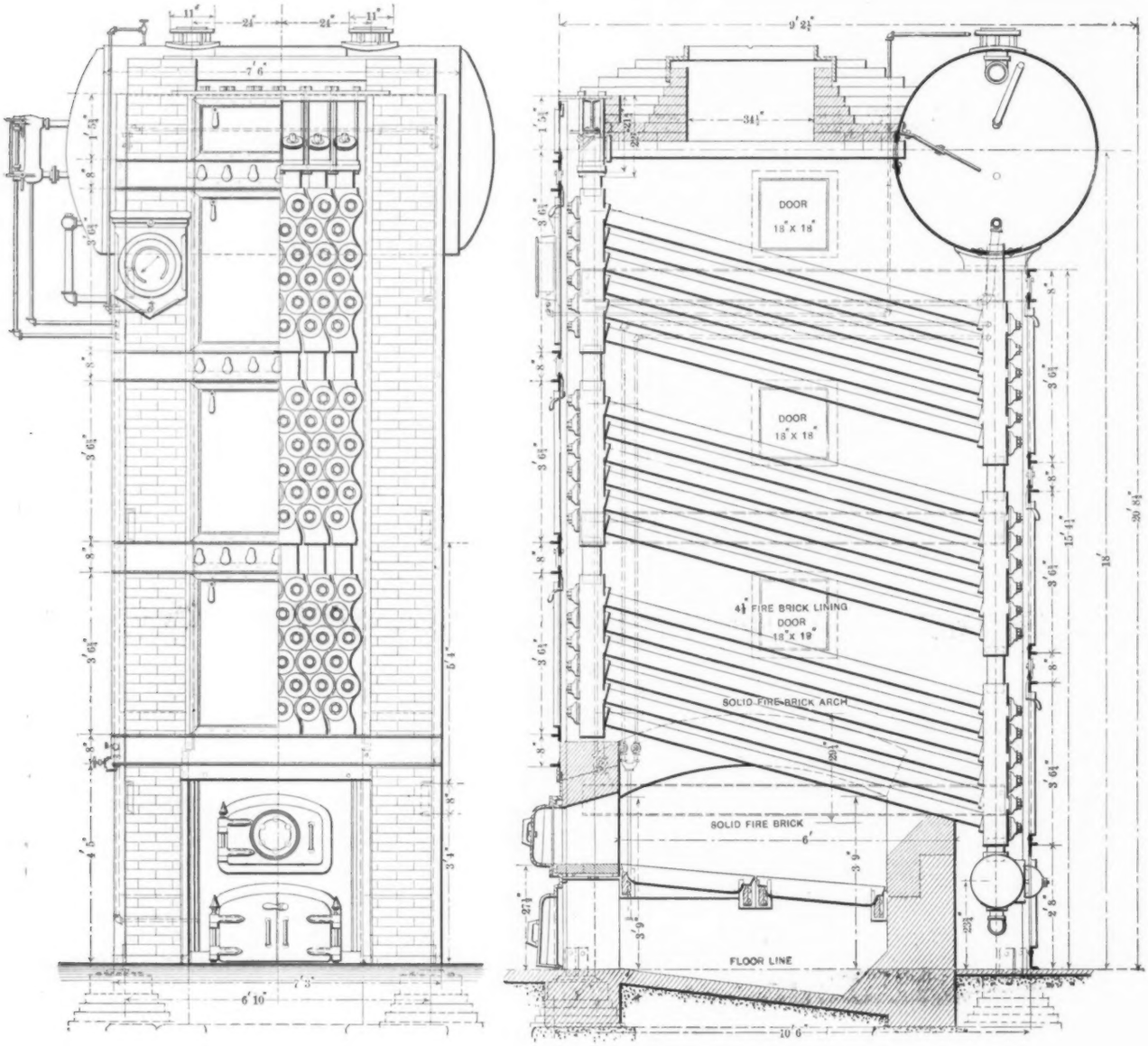


Fig. 11.—Triple-Deck Babcock & Wilcox Boiler, Utilizing Heat from Scrap Furnace and Billet Furnace.—N. E. Ayer & Co.'s Rolling Mill, Portland, Oregon.

"As a means of comparison it was decided to run a test of 24 hours' duration upon a plain cylinder boiler, similarly placed and also operated by waste gases. In this case, as in the other, the moisture in the coal was carefully measured, and, as in the former test, the Heisler calorimeter was used to obtain the moisture contained in the steam, the results of two series of observations taken as before being:

February 7, 1893. Per cent. of moisture in steam	2.32
February 8, 1893. Per cent. of moisture in steam	2.15
Average per run	2.23

"The dry coal burned on the grate of the furnace under the B. & W. boiler was 45,007 pounds; this was the total amount week's trial of 130 hours was 62,310, which amount divided by 45,007 pounds of dry coal fired gives 1.38 pounds of iron per pound of coal, while from the furnace under the cylinder boiler 13,200 pounds of iron were produced from 11,551 pounds of coal, or 1.14 pounds of iron per pound of coal.

"The draft in the B. & W. boiler was generated by a steam jet in the base of the stack and was very light, being only 0.31 inch of water pressure. This enabled a consumption of only 346.2 pounds of coal per hour, while the heat from double that amount could have been easily taken care of by the heating surface. Under the cylinder boiler a force draft was used, and the coal consumption averaged 481.3 pounds per hour. This amount hours, which figure, if taken, would reduce the coal consumption per horse-power during actual running time to 5.1 pounds, which result is better than can be obtained under cylinder boilers where the coal is burned directly upon the boiler grates and when the boiler is working at its point of maximum economy."

To show the fluctuations in the horse-power of the boiler from hour to hour the observations have been plotted in a series of diagrams, which we reproduce herewith, Figs. 4 to 9 covering the test of the Babcock & Wilcox boiler for the period under consideration, while Fig. 10 shows the result of the plotting of the same data for the plain cylinder boiler.

Test No. 7 deals with the results obtained with a Babcock & Wilcox boiler

over a heating furnace. The fluctuations in temperature to which a heating furnace is subjected are much less than those of the puddling furnace, so that the rate of evaporation of the boiler is quite uniform.

A more recent design by the Babcock & Wilcox Company for the utilization of waste heat over metallurgical furnaces is shown in Figs. 11, 12 and 13. It will be observed that there are three series of tubes, one above the other, constituting what is called the triple-deck type, the principal object in planning this arrangement being to avoid the chilling of the furnace gases to such an extent in their passage past a solid block of tubes as to prevent their ready combustion. Two boilers of this design have been in operation at N. E. Ayer & Co.'s rolling mill at Portland, Ore., each boiler consisting of three decks of tubes, each of which has 36 4-inch tubes placed six sections wide and six tubes high, making in all 108 tubes 9 feet long. One cross drum is provided, which is 4 feet 6 inches in diameter and 7 feet 6 inches long. Figs. 12 and 13 show clearly how the entire structure is carried by four columns outside of the brick work, thus relieving the latter of any undue strains. The following tests, conducted by C. J. Wolfenden, show the results obtained with this type of boiler.

From the report of Mr. Wolfenden we quote the following details: "One boiler was operated by the waste gases from a box scrap furnace and the other from the waste gases from a 2½-inch billet heating furnace. The water pumped into the boiler was measured by meter that had been previously corrected, which was placed between the pump and feed-water heater, thus insuring a nearly uniform temperature of the water passing through the meter. The coal was weighed upon platform scales that had been standardized.

"The draft was generated for the box scrap furnace by a No. 7 Sturtevant blower, running 1150 revolutions per minute, and for the billet heating furnace by a No. 6 blower of the same design and running at the same speed.

"Considerable variation was occasioned in the steam pressure and amount of water pumped into the boiler hourly by the cooling down of the furnace in charging or putting in a new bottom. No coal was burned on the boiler grates, they being covered with ashes. Both tests were commenced with a running start, the time being taken when the first heat was put into the furnace, and again when the last heat was withdrawn—the furnace at start and finish being at a white heat.

"September 12, 22,943 pounds box scrap was heated from 11,938 pounds of coal burned, equivalent to 1.92 pounds of iron per pound of coal.

"September 12, 15,022 pounds billet iron was heated from 9823 pounds of coal burned, equivalent to 1.52 pounds of iron per pound of coal.

"September 13, 21,966 pounds box scrap was heated from 9773 pounds of coal burned, equivalent to 2.24 pounds of iron per pound of coal.

"September 13, 16,000 pounds billet iron was heated from 8458 pounds of coal burned, equivalent to 1.89 pounds of iron per pound of coal."

	Sept. 12.	Sept. 13.
Heating surface per horse-power, square feet	8.2	7.96
Grate surface per horse-power, square feet	0 096	0 093
Coal burned per horse-power, pounds	6 0	5.32
Heating surface, each 1238 square feet	2,476.0	2,476 0
Grate surface (3 feet long x 4 feet 10 inches wide), square feet	29.0	29 0
Ratio of heating to grate surface	85.37	85 37
Kind of fuel used—Franklin coal, mined in Washington	Bituminous	
Duration of test, hours	12 0	11 0
Average steam pressure, pounds	91.2	90.3
Average temperature of feed water entering boiler, degrees	157.8	155 8
Pounds of coal burned, dry	21,760.0	18,230.0
Pounds of refuse	718.0	602.0
Pounds of combustible	21,042.0	17,628 0
Per cent. of ash	3.3	3.3
Coal burned per square foot grate per hour, pounds	62.5	57.1
Total water evaporated at temperature of feed, pounds	113,880.0	107,702.0
Water evaporated per hour at and from 212°, pounds	10,382.0	10,731.0
Water evaporated per square foot heating surface per hour at and from 212°, pounds	4 19	4.33
Water evaporated per pound coal—actual conditions, pounds	5.233	5.9
Water evaporated per pound coal, from and at 212°, pounds	5 724	6.46
Water evaporated per pound combustible—actual conditions, pounds	5.412	6 19
Water evaporated per pound combustible, from and at 212°, pounds	5 92	6 78
Quality of steam	Not observed	
Rated horse-power	240.0	240.0
Horse-power developed (horse-power = 30 pounds water evaporated per hour from feed at 100° and 70 pounds pressure)	301.0	311 0
Per cent. above rated capacity	25.4	29.5

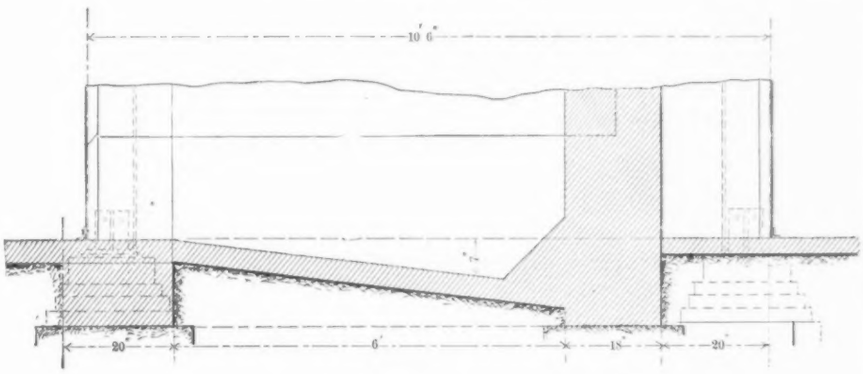


Fig. 12.—Section of Columns and Ash Pit.

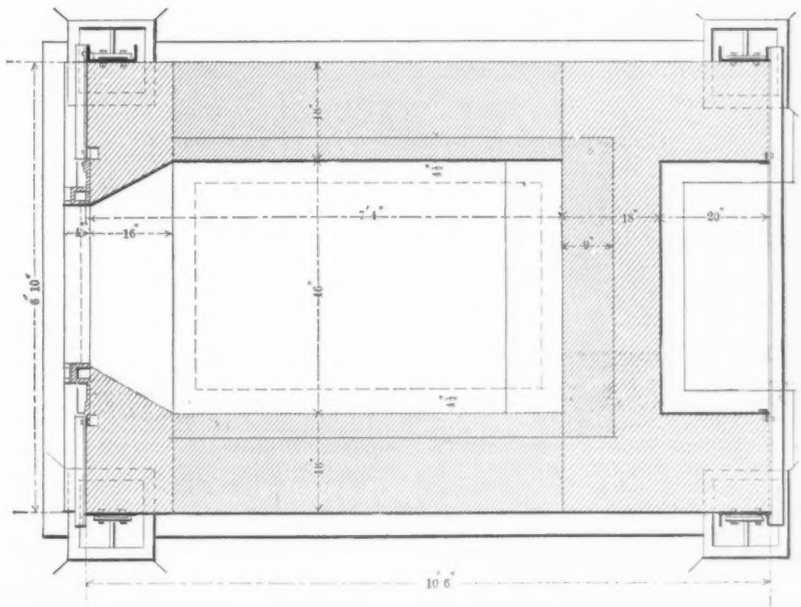


Fig. 13.—Plan of Columns and Ash Pit.

S. M. Green of Milwaukee, Wis., has signed a contract with a committee of Salt Lake City citizens to erect at the latter place an electrolytical copper refinery, capable of refining and turning out 25 tons of pure copper products per day. The plant will be 185 x 350 feet in size, and will be operated by a 1000 horse power triple-expansion engine. The boilers will be capable of developing 1500 horse power. It is stated in the agreement that the cost of the plant when completed, as specified in the agreement, will be $500,000, exclusive of the ground on which it is built, and that the works are to give employment to 300 men when running to full capacity. The work of erection will begin in 30 days. A bonus of $100,000 and property sufficient for the purposes of the plant will be given, one-half to be paid upon the commencement of the work of construction, $25,000 on June 1, provided the works are at that time half completed, and the remaining sum of $25,000 on September 1, 1893, providing the works are then fully completed and in operation. The promotor of the enterprise gave a bond for $100,000 to insure the successful carrying out of his part of the contract.

Strikes took place centuries ago, and with about as disastrous results as characterize the majority of the great labor struggles of the present day. At Breslau, in Germany, in the year 1329, brass workers inauguarated a strike which lasted for an entire year. In 1385 a strike of blacksmiths took place in Danzig, when the employers sought aid of the court, with the result that an order was issued by the municipal authorities that all workmen attempting to strike would have their ears cut off.

Foundations of the Allis Engine at the World's Fair.

There are but few persons, outside of the engineering profession at least, who have any conception of the magnitude and cost of the preliminary steps necessary in the installation of exhibits of heavy machinery at the World's Fair. By a wise provision of the authorities, all foundations are required to be as substantially and carefully constructed as though the engine or other machine were to be permanently located thereon, instead of being required for but six months' service. This precaution is especially necessary with reference to large engines, for the reason that it is impossible to render them self-contained, and they must, therefore, depend entirely on their foundations for maintaining, unchangeably, the requisite relative positions of the several essential parts. Any failure in this repect would inevitably affect the operation of the engine, and might spoil the costly exhibit, even if results were not still more serious.

All foundations are of uniform character of materials and construction. They are built by the Exposition Company at the expense of exhibitors, and from plans furnished by them and approved by the management. In all cases where the nature of the ground at the bottom of the excavation is not absolutely reliable, piles have been driven to cover the entire area of footings, and any subsequent settling of foundations is therefore almost impossible. The largest engine on exhibition will be that of the Edw. P. Allis Company of Milwaukee, Wis. Its rated duty is 2000 horse-power, which is just double that of those next in size—there being several of 1000 horse-power exhibited by different makers. The engine is of the well-known Reynolds-Corliss type, and is compounded for quadruple expansion. Some idea of its size may be had from the dimensions of foundations, of which we present full detail drawings of the several views. By reference to the plan, Fig. 1, the concrete footings are seen to be 61 feet 6 inches by 32 feet, with an extension at cylinder end of 12 feet by 9 feet. The concrete is 2 feet thick, made of clean, crushed stone of uniform size, with Portland hydraulic cement. This is laid in four separate courses 6 inches thick, and rammed until it forms a perfectly solid and homogeneous mass. A batter of 6 inches at top is given to the edges, and 18 inches back from the latter the foundations proper are started. These consist of two solid piers of brick work, laid in hydraulic cement mortar, and bonded in courses throughout the entire thickness. The usual batter from bottom to top is omitted—the sides and ends being perpendicular. Although entirely below the floor line, the external faces of the piers present an appearance as neat and smooth as that of the walls of a building—the brick being of good quality, carefully laid in even courses, and the joints neatly pointed. At each point of support of the cylinders, girders, and pedestals, a single bearing stone is let into the brick work, the top coming flush with the surface of the latter, except in case of the first and second cylinders, as shown. These stones have a uniform thickness of 18 inches. They are of smooth-dressed Lamont limestone, such as is commonly used for this purpose in Chicago and vicinity. The largest, supporting the two main pedestals, are 12 feet long by 4 feet wide, and weigh about 12,000 pounds each. The foundation bolts, of which there are 18 for each engine, are 3 inches diameter. They are held at the lower end by heavy cast-iron washers, 12 inches square, which are let into the concrete footing so as to come flush with bottom surface of the brick work. As shown in the plan, the locations of the four cylinders indicate that the engines will be what may be termed a pair of "twin-tandem" design, the first and third and the second and fourth cylinders arranged together, and each pair constituting a complete engine. The two piers have a common length of 57 feet 6 inches, and the width of that of first engine is 9 feet and of second 9 feet 9 inches. The depth from top of concrete is 11 feet 9 inches to top of foundation and 15 feet 1 inch to the center line of engines. The space from end to end between the piers is 9 feet wide, leaving a clear swing for the 30 foot fly wheel, with ample room around it, and no danger from flooding, as so often happens where the ordinary fly-wheel pit is used. The bond afforded between the piers by the continuous footing is depended on to prevent any independent movement of either foundation from the opposed motions of the two engines, as there is no other provision for counteracting this tendency. The engines are now in course of erection, with the expectation of having them completed and in operation by opening day, May 1.

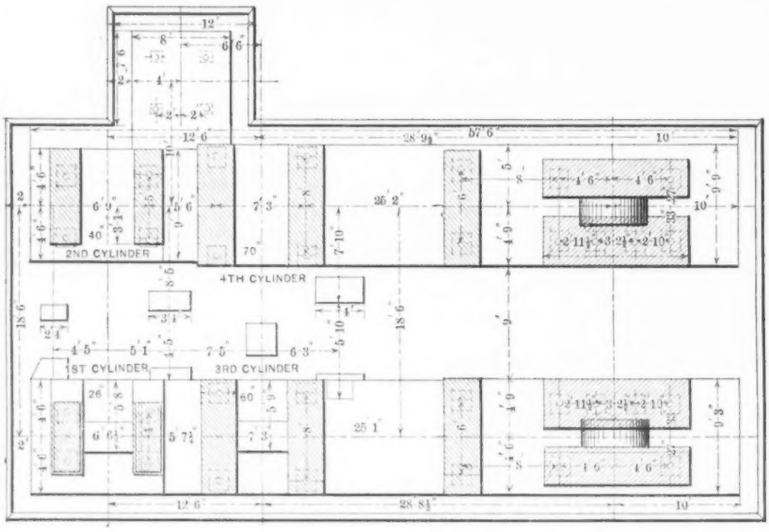


Fig. 1.—Plan

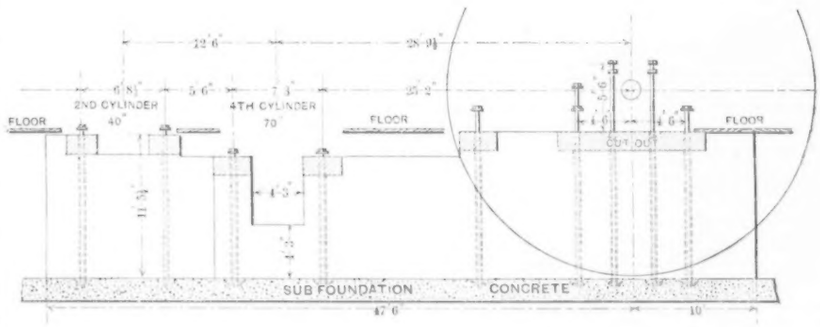


Fig. 2.—Elevation of Foundation of 2d and 4th Cylinders.

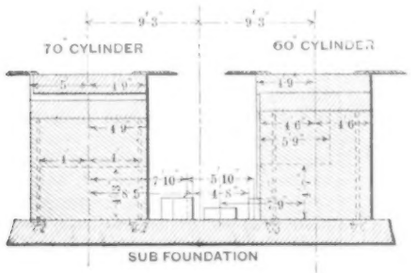


Fig. 3.—Cross Section Foundations of 3d and 4th Cylinders.

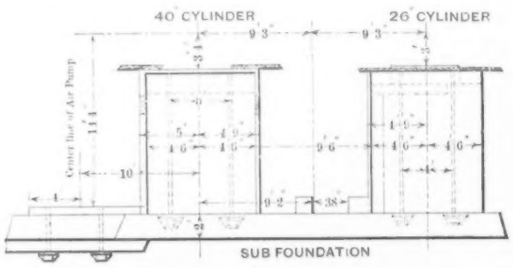


Fig. 4.—End Elevation 1st and 2d Cylinders.

THE FOUNDATIONS OF THE E. P. ALLIS COMPANY ENGINE AT THE WORLD'S FAIR.

The Telautograph.

An invention that holds promise of ranking with the telegraph and the telephone as one of the epoch making achievements of modern electrical science has just been promulgated. On Tuesday, March 21, was made the first public test of the telautograph, a long distance writing machine, the invention of Professor Elisha Gray of Chicago, which practically solves the problem of autographic communication over miles of wire. Representatives of the press were, by the invitation of the Gray National Telautograph Company, invited to witness the working of the new invention at their offices in New York and Chicago, where ocular demonstration was given of the practical utility of the system, to the complete satisfaction of those who witnessed the tests made.

Professor Gray's claim to be the first inventor of the telephone is well-known, and although this claim has, after prolonged litigation, been disallowed by the courts, many are found to dissent from the justice of that decision. The honor and credit of being the originator of the telautograph belongs to him, however, unchallenged. The original patent taken out for this instrument by Prof. Gray is dated July 31, 1888, since which time he has been engaged in perfecting his invention to the point at which it could be placed on the market in a practical form available for general use. This has now been accomplished and the telautograph is before the public as a commercial machine which, it is anticipated, will inevitably obtain a hold on business and social life similar to that possessed by the telephone.

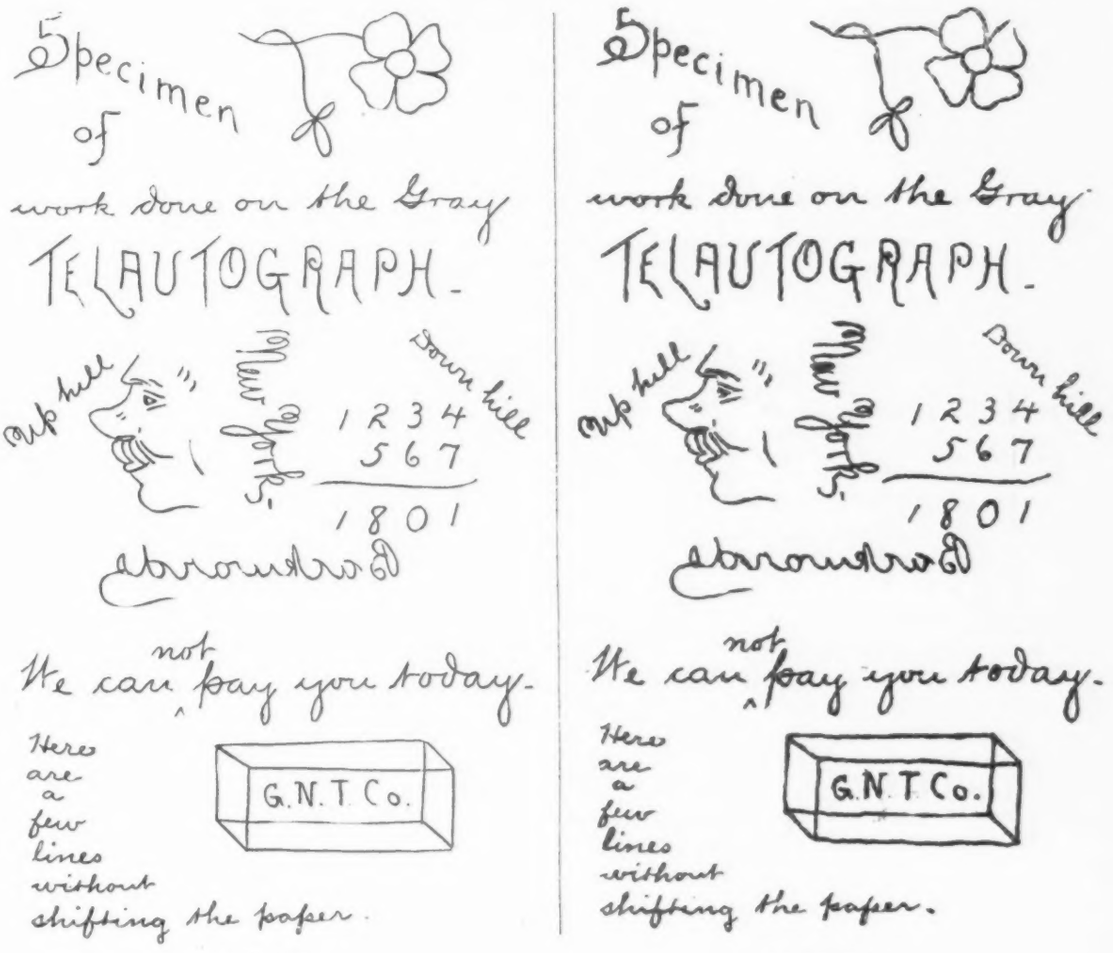
The telautograph is, briefly, an instrument by means of which arbitrary signs, pictures, diagrams, figures, tabulated statements and cipher or short hand writings are transmitted, as well as ordinary hand writing, to any distance; what is written at one end being reproduced in *fac simile* at the other end of the circuit.

In an extended article on the subject, the *Electrical World* gives a full description of the machine and its history, from which we extract the following information. The telautograph consists of two machines, a transmitter and a receiver. The principle of the invention as technically described in the terms of Professor Gray's patent, is "the combination with two main circuits, each including a pole changer, an interrupter, receiving magnet, and a polarized relay, arranged to direct the current through one or the other of the magnets according to its polarity, of a transmitting pen connected to operate said interrupters by its movements in two directions crosswise of each other; two local circuits, each including the magnet of one of the pole changers, and a circuit maker and breaker, which is also connected to and operated by the pen, to change the condition of its local circuit and thereby change the polarity of the current over the corresponding main circuit when the movement of the pen in either direction is reversed; and a receiving pen moved in two directions crosswise of each other through the action of the magnet of the respective circuits, and in opposite directions through the action of the respective magnets of each circuit, substantially as set forth."

As two motions, independent of each other, are to be reproduced, two electrical circuits are involved in the transmission; and since it is a well-known fact that pulsations of successively opposite polarity can be sent over a line wire with greater rapidity and certainty of effect than pulsations of successively like polarity, alternating currents are employed in both these currents.

In the completed machine a series of contacts have been arranged, over which there wipes a brush, so that the number of pulsations in that circuit is determined by the distance which the pen is moved in that component direction, and the speed of succession of the pulsations varies with the rapidity of movement in that component direction of the transmitting pen. This pen or pencil (in fact, any pointed instrument may be used with the transmitting instrument) is attached by flexible cords at right angles to each other to two drums concentric with attachments on either side of the instrument. Rigidly attached to these drums are brushes which, as the drums revolve, sweep over the contacts in the direction of revolution. Also attached to each drum is a lever arm, which makes contact either with a front or rear stop, as the direction of revolution is backward or forward, thus changing the direction of motion at the receiving instrument simultaneously with that of the transmitting pen. The alternating current for each circuit is supplied by two batteries, one at either end, so connected as to oppose each other, the battery at the transmitter being usually of about twice the strength of the other.

The movements of the transmitting pencil are thus recorded by the winding and unwinding of the cords upon the drums and the motions of the brushes



As Written. *As Received.*

SPECIMEN OF WORK DONE ON THE GRAY TELAUTOGRAPH.

regulating the current impulses, which at the distant station control the receiving pen. At the transmitting instrument the paper is fed from a roll which is moved by the sender as the length of the message requires. The course of this paper leads over a metallic plate some 2½ inches wide and about 4 inches long. An area of this extent can be written on without motion of the paper. This plate, which forms an excellent writing surface, is also the connecting link between the two sets of batteries which supply the transmitting currents. Normally these are broken, and the receiving pen is held from contact with the paper at the further end by a spring actuated by a lever arm. The slightest pressure of the transmitting pen, however, upon the paper above the metallic plate is sufficient to close the circuit and bring the receiving pen in contact with the paper, ready to produce the characters transmitted. Whenever the transmitting pen is lifted from the paper, to commence a new line, cross a *t* or dot an *i*, the motions will be reproduced at the other end by the receiving pen. The latter, which is placed at the junction of two aluminum arms, consists of a glass tube drawn out at its end to capillary proportions and filled with an easily flowing ink, and automatically fed by a rubber bulb.

The instrument, in fine, is as simple as such an instrument can be, and may be as successfully operated by a child as by the most expert electrician; the reproduction of anything that can be written or drawn is as perfect as possible; and the communication between sender and receiver can be conducted with a secrecy as sacred as any sealed letter; no eyes but theirs need see the telautogram. In this latter respect it possesses advantages over either the telegraph or telephone which will be appreciated by business men.

It is proposed to follow out the line so successfully adopted in the telephone exchange business, subscribers being connected with each other through central exchanges and switchboard in exactly similar manner. The speed of transmission is only limited by the speed at which the subscriber is able to write. The average speed would probably be from 25 to 30 words a minute. The current employed in the telautograph is about the same as that employed in the telegraph, and the distances it is possible to reach are about the same as those that can be reached by the Morse signals, without relays, that is, about 500 miles. The relay system will probably be eventually adopted, so that, as the *Electrical World* remarks, "the time may not be far distant when the banker in New York may attach his autograph to a check in San Francisco as readily as he now communicates with his broker through the intervention of the Morse code and the telegraph operator."

The cut which accompanies this sketch, reproduced from the *Electrical World*, represent a telautographic message as written and received through an artificial distance representing one mile. This shows clearly the fidelity of the reproduction. Printing, script, and sketches transcribed horizontally, uphill, downhill and backwards are all with equal faithfulness copied by the receiving pen. The illustration shows the exact size of the transcribing plate.

The importance of the new invention in its relations to the commercial, industrial, press and social worlds is something that cannot at present be estimated. The exact reproduction of messages at a distance will obviate many inconvenient mistakes, and the transmission of fraudulent or wantonly misleading messages will be rendered less easy than is the case by telephone or telegraph. For police purposes it will be found valuable in transmitting the lineaments of people who are "wanted" by the representatives of their country's laws.

When the telautograph attains general adoption there will be a reasonable justification for such cases of skepticism as that recorded of the old Scotchwoman in the early days of the telegraph, who indignantly denied the authenticity of a message sent to her by an absent son through that novel and strange channel, saying. "She knew Rab's han' writin' weel eno' and they werna' her bairn's marks."

To quote in conclusion once more from our electrical contemporary: "Now that we can recognize the voices of our friends and communicate with them in autograph over miles of wire, there would seem to be but one step left for the future by which space may be totally annihilated—namely, that we may also see our friends as they speak and write. What genius will enable us to do this?"

The Scully Steel & Iron Company.

The Scully Steel & Iron Company have removed from 64 South Canal street to their new warehouse at 136 to 146 Fulton street, Chicago. This warehouse, which has been specially fitted up for their purposes, is undoubtedly one of the best appointed plate stores in the country. The building is a one story structure, 130 feet long by 170 feet deep and 30 feet high to the square, extending from Fulton street in front to Wayman street in the rear. It is divided into several compartments. The offices extend along a considerable part of the Fulton street front, opening into the warehouse in the rear, the level of which is several feet lower than that of the office. The plate room occupies half of the building on one side. On the other side are the sheet and bar room, with the tube room in the rear. Rivets are stored in a spacious room extending under the Fulton street sidewalk. Pneumatic lifts or trolleys, with a vertical range of 6 feet and a carrying capacity of 3 tons each, run on overhead railways from one end of the warehouse to the other, enabling the heaviest plates to be handled with ease by one or two men and taken from any part of the warehouse to wagons in the rear.

There are three wagon entrances to the building. Thus plates can be received or shipped at one door, sheets at another and boiler tubes at the third, while rivets are being handled through a sidewalk opening in the front. Teams with boiler tubes and sheets can be driven directly to the racks where they are stored. These racks are quite a feature of the sheet and tube departments. Racks are vertical for large sheets, which stand on end along the wall, and horizontal for small sheets and tubes. Three large tube racks will hold 100 tons each, there being additional racks for smaller sizes. In the plate department the larger sizes are laid flat and the smaller sizes stand in vertical racks or compartments. The whole warehouse is well-lighted by skylights in the roof. Electric light will be used when necessary on short days in the winter. Every detail has been carefully studied with a view to securing the best arrangement possible for handling stock expeditiously and with the minimum of labor.

The offices have also received very careful attention. They are spacious, lighted with large windows and well appointed in every other particular. Georgia pine has been used for walls and ceiling, while the floor is of hard wood. All the modern conveniences for the facilitation of business have been introduced. Steam heat will be used. The location is an admirable one for the transaction of both local and outside business. It is in the center of the district devoted to the manufacture of boilers and machinery and within easy reach of freight depots, both rail and water. The enterprise which the company have shown in so greatly improving the facilities should meet with a substantial return in largely increased business.

The Decline of Boston as a Speculative Center.

There is much lamentation, the Boston *Review* says, over the more and more second rate position which that city is being forced into as a speculative center. "The time was," the editor says, "when Union Pacific found here its main market, when Atchison was almost unknown on the New York Stock Exchange, when Chicago, Burlington & Quincy could hardly be dealt in there for lack of sufficient certificates on the street. With the collapse, however, in Union Pacific & Atchison, and the depression in Chicago, Burlington & Quincy since the great strike of 1888, large amounts of floating stock in each of these companies have found their way to New York, and the New York transactions in them, as compared with the Boston transactions, are something like ten to one. All the initiative in their movements likewise comes from New York, and it has been said, with some truth, that the Boston Stock Exchange really opens at two minutes past ten—on receipt, that is, of New York quotations. If by any chance New York has a holiday, the Boston Stock Exchange closes. Moreover, there is a constant drift of securities to the larger market. The Illinois Steel Company securities have just been listed on the New York Exchange, though hitherto dealings in them have been principally, if not entirely, confined to the unlisted department of the Boston Stock Exchange. And the consolidation of the Edison and the Thomson-Houston Electric Companies into the General Electric Company has meant the loss to Boston of an independent market for a stock which represented a great and growing industry.

The real market in Boston for stocks seems to be confined more and more to copper stocks, electric stocks of less consequence than General Electric, and purely local stocks. Of the last class, the local railroad stocks seem more likely to leave than would have been thought possible until very recently. For years Boston has done little more than echo New York in dealings in New York & New England stock, and a Philadelphian is now President of that Company as well as of the Boston & Maine. The Old Colony also has just passed into New York hands, and the "partition of Poland" between the New Haven and Boston & Maine railroads, and the constant talk of Vanderbilt purchasing of first this and then that local railroad, suggest that Boston control of New England properties may, before long, be a thing of the past. Boston people have long blamed one another for not having owned the great railroad connecting New England with the West, and for having invested in roads in the far West which not only could do nothing for Boston as a port, but have too often given a very poor account of themselves to their owners. Now this proud and rich city would seem to be in danger of loosing control of the New England railroad companies themselves, which lead to her very gates.

The workmen employed in the Tyne and Wear engineering trade in England, about 15,000 in number, have received from their employers notice of a reduction of 10 per cent. on all wages above 20 shillings per week, and of 5 per cent. on wages at or below that figure, to take effect from May next.

Capitol Pipe-Threading and Cutting-Off Machine.

The Capitol Mfg. Company of Chicago have made quite a radical departure from present methods employed in pipe-threading machinery, having adopted for this special service the methods used by them in threading and milling rods and bolts and cuttting off iron and steel. Instead of revolving, the pipe being threaded, it is held stationary and the threading head, which contains the dies or chases, revolves. We have repeatedly referred to the principles involved in the design of the Adams automatic threading head, which the Capitol Mfg. Company used in their machinery. In this case it is simply larger in dimensions. It opens and closes automatically like the regular bolt-threading machinery made by the company.

By reference to the accompanying engraving, it will be observed that on the opposite end of the bed to the threading head is a chuck which grasps the pipe after the thread has been cut to proper length. One movement of the lever holds the pipe sufficiently well for cutting off purposes. The cutter itself is fastened in a holder which is located in the vise jaws on a carriage by the cutting head and the gripping chuck, as seen in the engraving.

The cutter used for cutting off is a regular cutting-off lathe tool, while the vises on the carriage act as steady rests and are self-centering. The threading dies are flush with the head holding the same, and short pipe can be threaded on both ends its entire length. The cutting off tools can be moved to cut the pipe any desired length, and the machine can be used for both cutting off pipe into short or long lengths. The threading dies are just the same as those used on the Adams bolt threading machines. They are durable and can be rehobbed several times.

Both spindles are hollow and are provided with collars on the inside to prevent the pipe from sagging or bending. The oil or lubricant required for threading purposes is held in the basin of the machine and is pumped by means of a rotary pump and used over and over again. The supply can be regulated to suit the requirements.

The machine takes up little room and does the work quickly. The engraving represents the No. 4 machine with a capacity from ¾-inch to 4 inch pipe. The machines are made in all sizes up to 16 inches. The machine can also be used advantageously for threading and milling rods and bolts and for cutting of iron and steel.

Diamond-Making and the Electrical Furnace.

In *The Iron Age* of February 2, an account was given of the employment of a small electrical furnace by Henri Moissan, an eminent French scientist, in conducting certain scientific investigations rendered possible by utilizing for such purposes the intense heat generated by the electric arc.

Continuing his work in the practically new field of research thus opened, M. Moissan has recently been able to report to the French Academie des Sciences that he has succeeded in producing diamonds artificially. While this achievement is a matter of scientific and popular interest, it is as yet of no commercial importance. The diamonds obtained, although undoubtedly genuine, are exceedingly small in size, and serious difficulty would be experienced in employing on a larger scale the process which has yielded them.

Without going into the details of the study and research resulting in the successful solution of a problem which had so long defied attack, it may be said that the end desired was not accomplished by chance nor in a hap-hazard way, but was gained by means of patient reasoning and experiment and at a considerable cost both of time and money.

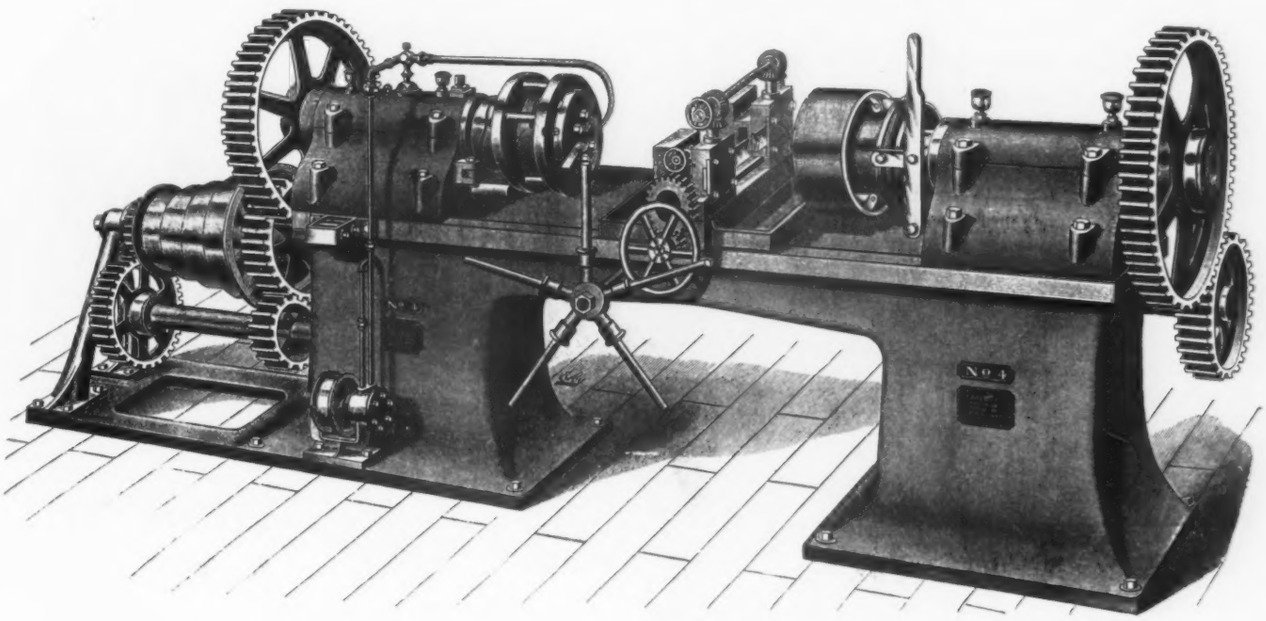
Briefly stated, the process consists in causing the absorption of a quantity of carbon by molten iron subjected to intense heat in a small crucible within an electric furnace, the crucible and its contents being then plunged suddenly into ice water. The result is a formation of a shell or crust of iron which hardens quickly, while the interior is still in a state of fusion. Under these conditions the cooling of the inner portion causes the excess of carbon to assume the form of minute diamonds imbedded in the iron. The diamonds can then be obtained by applying strong acids to dissolve the iron.

By the use of the electrical furnace, which enabled him to accomplish the results already noted, M Moissan has also been very successful in the reduction of certain metals, and has recently reported the results of his laboratory work in this direction.

The rare metal uranium was procured from its oxides, which are practically irreducible at any temperature ordinarily obtainable by other means than the electric arc. An ingot of uranium, weighing several ounces, was yielded in less than a quarter of an hour. Small ingots of chromium and of manganese were produced even more quickly, although their reduction by other processes usually absorbs considerable time.

Coal Dust Explosions as a Motive Power.—Accounts come from Germany that Krupp, the famous gun maker, is now building a number of experimental engines to test a novel idea. A German inventor has taken patents on the utilization of the general principle that finely divided carbonaceous matter floating in the air readily explodes. He proposes to grind coal to an impalpable powder, and after introducing the dust floating in the air into the cylinder of an engine, explode it, the idea being to follow very much the same lines which are being so thoroughly developed in the use of gas in engine practice. Naturally, the first question which has risen has been how to get rid of the ash. Krupp is reported to have stated that his experience in gun manufacture convinces him that this is not a serious obstacle. The advantages which would grow out of a direct utilization of mineral fuel as mined are very obvious. While modern practice converts only 10 to 15 per cent. of the heat energy stored in coal into power at the crank shaft of a steam engine, it is believed that no less than 75 to 80 per cent. could be made available by the direct combustion of the fuel through explosion of coal dust.

A 5 per cent. reduction in wages has been agreed upon between the mine owners and miners in the Durham and Cleveland districts in England. In each case a reduction of 10 per cent. was asked for by the employers, but was successfully resisted by the men.

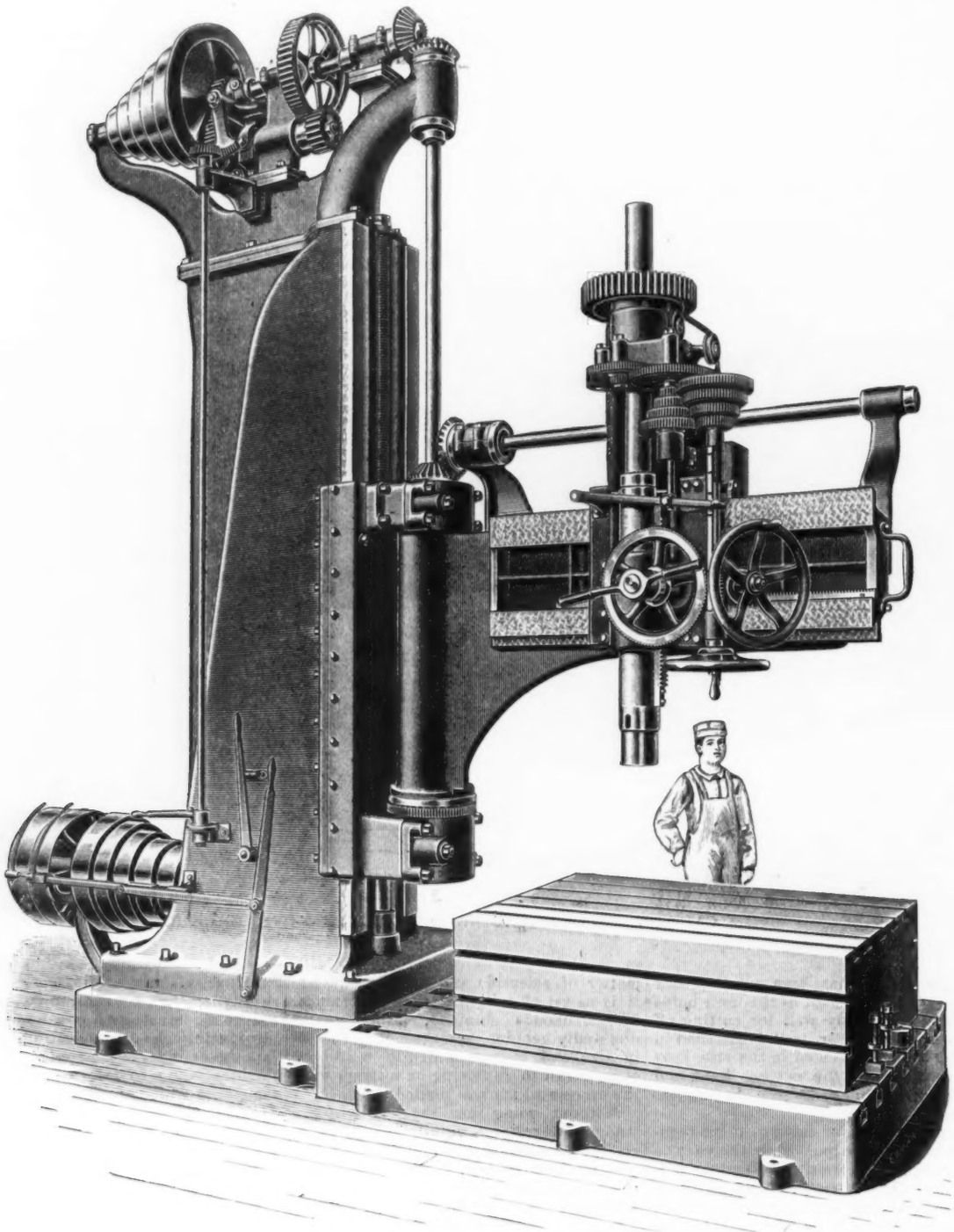


THE CAPITOL PIPE-THREADING AND CUTTING-OFF MACHINE.

The Prentice Single-Spindle Drilling Machine.

Prentice Brothers of Worcester, Mass., have just finished what is said to be the largest single spindle drilling machine ever built in this country. It is now at the Pittsburgh Locomotive and Car Works of Allegheny City, Pa. The drill measures 16½ feet in hight and occupies a floor space of 15½ x 5½ feet and weighs 34,000 pounds. The bracket supporting the arm is gibbed to the upright column and has a vertical adjustment by power, operated by the hand lever shown on the base of the column. The spindle is counterbalanced, has a quick return movement, hand and power feed and four changes of feed. The head carrying the spindle is moved along the arm by a hand wheel. The changes of feed are obtained by a pull spline, locking the different feed gears together. The machine is gear driven from the horizontal top shaft.

An idea of the size of the drill may be formed from the fact that it will drill to the center of a 26-foot circle, and that the greatest hight from the spindle to the base is 96 inches.



THE PRENTICE SINGLE-SPINDLE DRILLING MACHINE.

Another step toward opening up the interior of the "Dark Continent" is noted. The African Transcontinental Telegraph Company have been chartered in London with the object of establishing through telegraphic communication with Central Africa, connecting with the Egyptian and South African lines and traversing the entire continent.

The consumption and production of various metals in France show the following comparison, as presented in the latest official returns: Of lead, the consumption is 60,500 tons, of which 11 per cent. is produced in France; of zinc, the consumption is 47,000 tons, and production 44 per cent.; of copper, 28,000 tons and 3 per cent.; of tin, 5200 tons and production nil; and of nickel, 921 tons and 36 per cent. France is therefore indebted to foreign countries for 89 per cent. of its consumption of lead, 56 per cent. of its consumption of zinc, 92 per cent. of its consumption of copper, the whole of its consumption of tin, and 64 per cent. of its consumption of nickel.

The Merriam Percussion Fuse.

In *The Iron Age* of March 30, 1893, in the article "Trial of the Dynamite Gunboat 'Vesuvius,'" we illustrated and described very fully the Rapieff fuse, which was the one employed thoroughout the recent test. In order that this fuse may be compared with the one designed by Henry P. Merriam we take the following description by Mr. Merriam from the *Journal of the United States Artillery:*

in a recess in the fuse case; the percussion caps, of which there were three, were circularly disposed in front of the spherical hammer. This arrangement of hammer and caps is similar to that shown in Fig. 1. The action of this is such that a direct axial retardation of the shell causes the ball to strike all three caps simultaneously, while a side blow causes the ball to be displaced laterally and to move forward in the cavity, thus coming in contact with one or more of the primers. In this fuse the safety device consisted of a small weight and a spring which positively held the ball away from the caps until the shell

the base of the shell and that applied to the small releasing weight of plunger. This relation may be stated thus:

$$\frac{\text{Total force acting on base of shell}}{\text{Force acting on plunger}} = \frac{\text{Total weight of shell}}{\text{Weight of plunger}}$$

This is strictly correct only when the shell and the plunger are regarded as freely moving bodies; the total force imparting velocity to the shell is less than the total force applied by an amount necessary to overcome friction, to set up the rotation of the shell, &c. If the force applied to the starting of the plunger is

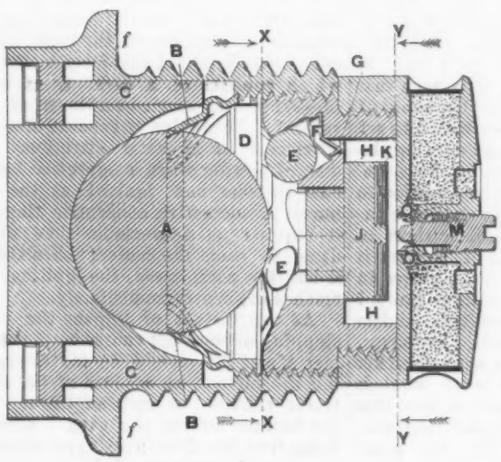


Fig. 1.—Vertical Longitudinal Section.

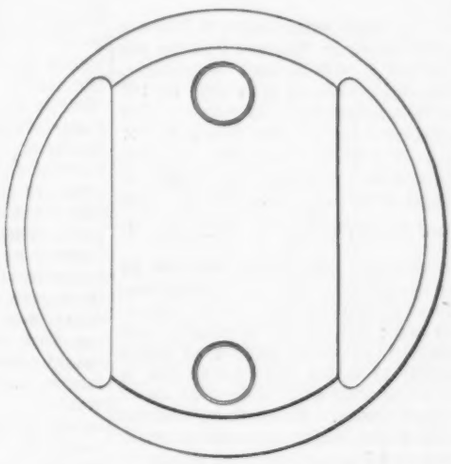


Fig. 2.—Rear Elevation.

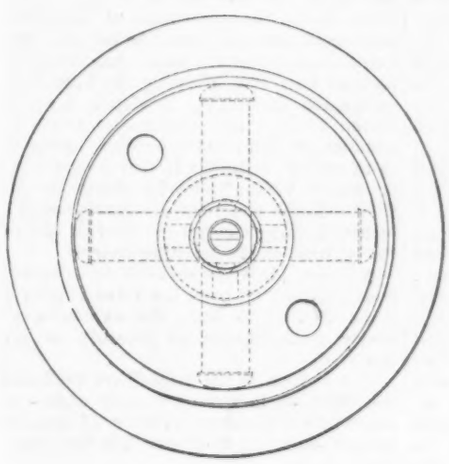


Fig. 3.—Front Elevation.

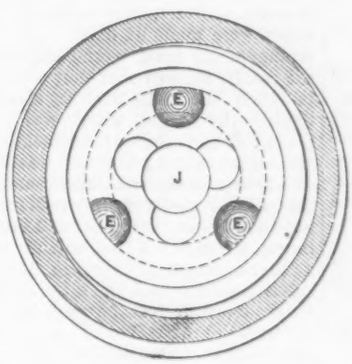


Fig. 4.—Section on x x of Fig. 1.

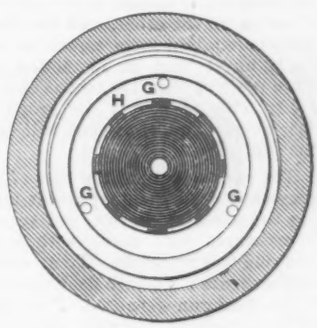


Fig. 5.—Section on y y of Fig. 1.

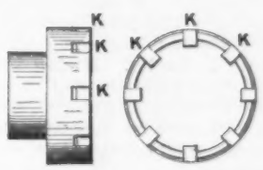


Fig. 6.—Valve for Controlling Delay.

THE MERRIAM PERCUSSION FUSE.

The fuse to be described in this article was the outcome of a series of experiments made at the Sandy Hook Proving Grounds during the years 1890–91. It was the purpose of these experiments to produce a base percussion fuse which would be suitable for shells of the larger calibers, and more especially for rifled mortar shells. The chief requirements to be fulfilled were:

1. Safety in handling and transportation. 2. Certainty of action upon concussion on a target—this to mean that a burst should occur whether the shell strikes point foremost or sidewise. 3. Delay after concussion, to allow time for the shell to penetrate before exploding.

The first fuses to be fired were made with a spherical hammer mounted loosely was fired; then the small weight, in taking up the velocity of the shell, was forced over the spring and the spring and weight retreated together into the ball. Several of these fuses were fired from an 8 inch M. L. rifle with satisfactory results. On further trial of this type in a 12 inch B. L. mortar, two out of the first three fired failed to explode. These two were recovered and it was found that the safety device had not been released. To investigate this point further, experiments were made with a 3.6-inch B. L. field mortar, using small charges; the shells, not being loaded, were recovered and the fuses examined. The results thus obtained served to confirm previously-calculated results as to the relation between the total force applied to calculated by the above equation, using the pressure per square inch as given by a crusher gauge, the result obtained represents the greatest possible force to which the plunger can be subjected in starting—frictional and other losses being neglected. The actual force applied is always less than this theoretical amount—some experiments showed a loss of upward of 50 per cent.; this, however, may have been largely due to irregular friction of the plunger. To illustrate by an example: Suppose a shell for a 12-inch B. L. mortar weighs 650 pounds; that the maximum pressure applied in its discharge is 6000 pounds per square inch—this being, perhaps, the extreme lowest pressure that would be used; the plunger may be assumed to weigh 2 ounces. The total force applied to the

base of the shell equals $6000 \times 113 = 678{,}000$ pounds.

$$\frac{678{,}000}{x} = \frac{650}{\frac{1}{3}} \text{ from which } x = 130$$

This is the maximum limit of the force applied to the starting of the plunger. As is usually the case, the plunger is pierced by a pin or spring which is forced through the plunger at the instant of discharge, this action serving to arm the fuse. For safety against premature explosion considerable force is required to overcome the friction of the pin or spring. If with such a plunger as this it is assumed that a force of 130 pounds is necessary to start the pin, then, theoretically, the fuse would just be capaple of arming by the shock of discharge.

To see to what extent such a fuse can be roughly handled: Suppose that the pin can be forced $\frac{3}{16}$ inch through the plunger, and that the frictional resistance of 130 pounds is constant for this travel. The energy necessary to arm the fuse is $130 \times \frac{3}{16} \times \frac{1}{12} = 2.03$ foot-pounds, and the hight from which 2 ounces, the weight of the plunger, must be dropped to give this amount of energy is $\frac{2.03}{\frac{1}{8}} = 16.2$ feet. If such a fuse be dropped 16 feet and its velocity be suddenly checked by striking squarely on its base the fuse will be effectually armed; but to be reasonably sure that this will take place when fired under the conditions stated the fuse should be capable of arming with a drop of about half this distance. This, then, reduces the fall to 8 feet, which is much too small, and, moreover, a succession of shocks or falls from a less hight will have the same effect as the single drop of 8 feet. It is apparent that there is not margin enough between safety on one hand and certainty of action on the other, and for this reason there is required some means for releasing the plunger that in its action shall be more positive than the inertia of a weight; for to change merely the proportions of the weight and resistance will not solve the difficulty.

The gas pressure at the base of the shell presented a satisfactory means for operating the releasing device, and accordingly, experiments were made with a type embodying this principle. To avoid unnecessary expense a 3.6-inch field mortar and a 3.6 inch field gun were used. Fuses were fired under pressures varying from 3000 to 38,000 pounds per square inch, and as no failures occurred it was concluded that their certainty of action was fully established; as a final proof, however, a number of shells were fired successfully from a 12 inch B. L. mortar. During these experiments some difficulty was encountered in shells bursting in the gun, but this was not attributed to the action of the fuse; for, as was afterward shown, bursts occurred with equal frequency in the firing of shells from the same lot, loaded with powder, but with the opening in the base closed by a base plug instead of a fuse.

The delay was next taken up. To discuss this part more clearly take the case of a loaded projectile without a fuse—sometimes known as a "blind shell"—fired against armor. It is a well known fact that when the armor exceeds a certain thickness—this thickness varying with the size and character of the projectile—the heat developed at the instant of concussion is sufficient to ignite the contained bursting charge and cause explosion after the shell has passed through. With a still more resisting target the heat would be more intense and more quickly developed, and the burst would then occur before penetration, in which case comparatively little damage would result, unless the explosion be so violent as to shatter the plate. Attempts have been made to overcome this difficulty of premature bursting by inclosing the charge in non conducting bags, but no advantage has been thus secured. For this reason it is considered advisable by some authorities to dispense with bursting charges in projectiles for use against armor, and to trust to the destructive action resulting from the penetration of such a missile into the body of a ship.

In cases, however, where the resistance encountered is insufficient to develop the required amount of heat a fuse is a very necessary part of the shell and greatly increases the destructive effect. The greater proportion of war vessels are not provided with such effective protection as would require explosive projectiles to be dispensed with, and against these vessels armor-piercing shells, loaded and fused, would do most effective work. If examination is made of the action of a shell at the instant of concussion, it is seen that there is required a certain brief interval of time—about 0.005 second—in which to set up the action of the fuse and develop the force of the bursting charge. This cause a certain delay, but a delay in addition to this is necessary at times to insure complete penetration. To secure so short an interval of time by a train of powder is impossible; by restraining the plunger in its movement toward the caps a limited delay may be obtained, but this renders the fuse less sensitive, and, moreover, would cause a shorter delay with a thicker target, which is the reverse of what is wanted. What is required is that the delay be proportional to the resistance overcome by the projectile in penetrating the target—*i. e.*, if thin plating is encountered the shell should explode with no delay beyond the time required to ignite the charge; while if thicker plating is encountered the time before exploding should be proportionally greater; this discrimination should be made automatically.

It was with a hope of realizing, in a measure at least, this action that experiments were made on delay. At first the arrangements tried were complicated and the results showed that they were too slow in action, the shells bursting about 75 feet behind the target, which was of 3 inch plank; finally the arrangement shown in the accompanying diagram was tried and this showed a marked improvement. With this device shells were fired from a 3.6 inch field gun through a 3 inch plank target, through a 4 foot butt of sand, and a plank target of varying thicknesses: shells fired through the 3 inches of plank burst about 5 feet beyond, and with a thickness of 52 inches of plank the burst occurred at practically the same distance in the rear. About 30 shells were fired in these experiments and the results were highly satisfactory. The final proof that the delay is proportional to the resistance would be a trial with armor-piercing shells fired against armor plates. So far this has not been attempted.

The fuse as now constructed will be readily understood from the following description and diagram:

Fig. 1 shows a longitudinal section of the fuse, showing parts as they exist previous to firing.

Figs. 2 and 3 are end elevations.

Figs. 4 and 5 are sections along *x x* and *y y*, respectively, looking in the direction of the arrows.

Fig. 6 shows, in separate view, the valve upon which the delay action depends.

Referring to Fig. 1, in the fuse case, which screws into the base of the shell, plunger or hammer A, for exploding the caps, is in the form of a sphere. This is held securely in the position shown by the clips B B, which abut at one end against a circular recess in the ball, and at the other end against a shoulder in the fuse case. When, in the discharge of the shell, pressure is applied to the trips C, the clips B B are forced off from the shoulder in the fuse case and thus free the hammer A. A flat spring D serves to keep the ball to the rear of the cavity during the flight of the shell.

When the velocity of the shell is suddenly checked upon striking a target, the ball, by its momentum, strikes one or more of the small balls E—see also Fig 4—placed above the fulminate caps F and explodes the latter. The resulting flame escapes through the channels G—see also Fig. 5—into the chamber H. It is also evident from the arrangement of the ball A and its surrounding cavity that should the shell strike squarely on its side, the ball in being thrown to one side of the cavity is forced to move forward and thus explode at least one of the caps. In the chamber H is placed the delay mechanism, which consists of a disk, I, of closely pressed powder carried on the front of the valve J. This valve is capable of a slight movement in an axial direction. This disk of powder when compressed between two surfaces and ignited at the edge burns in successive concentric rings, and it requires an appreciable time for the flame to reach the center; when the disk is not thus compressed, the igniting flame reaches the center immediately.

At the instant of impact the sudden stopping of the shell causes both the hammer A and the valve J to move forward, but the valve J, on account of its shorter travel, reaches its seat an instant before the hammer strikes the caps. When the flame from the fulminate caps enters the chamber H, the valve J is pressed firmly against the front surface and the flame ignites the edge of the disk of powder through the windows K—see Fig. 6. As long as the shell is undergoing retardation the disk I remains forced against the forward face and the flame advances slowly, as before stated; when the shell has passed through or has stopped in the target, this force, due to the momentum of the valve, ceases and the gas pressure between the two sufaces forces the valve away from the forward face, thus allowing the flame to at once reach the center. A wisp of dry gun cotton closing the channels O serves to conduct the flame to the powder contained in the radial chambers L, and from thence it passes to the bursting charge in the shell. These chambers L contain supplemental flashing charges to further insure the ignition of the bursting charge.

A screw, M, when screwed down serves positively to hold back the valve J, should it be desired to have the explosion as nearly instantaneous as possible at all times.

The pistons on the trips C are rendered gas tight by means of copper caps—arranged after the usual manner of crusher gauges—and tallow or wax fills the space above these.

When screwed into the shell, leakage of the powder gas by way of the threads is prevented by a washer at the shoulder *f f*.

The small balls E are secured in place by being set in the recesses somewhat deeper than half a diameter; a burr at the edge of the recess then holds them.

The safety of this fuse in handling has been abundantly tested by dropping and throwing about. As for certainty of releasing upon discharge, this is fully secured by the size of the pistons and the fact that there are two; either one releasing being sufficient. Certainty of exploding upon striking is secured by employing three percussion primers instead of one; that three defective caps should happen to be in the same fuse is well-nigh impossible. Finally, the delay mechanism for mortar shells would seem to be all that could be desired. It may be said by way of anticipating a criticism that the apparent complication is due to a duplication of parts

which secures greater certainty of action. Over 60 of these fuses have been fired and not one has failed to act.

CANADIAN NOTES.

(By a Special Correspondent.)

The third session of the seventh Parliament of Canada was porogued on the 1st inst. It was one of the shortest since confederation, and was not more fruitful than it was lengthy. In trade legislation it was especially disappointing. The Premier and the Minister of Finance had led the country to expect a revision of the tariff. Apparently no such idea was seriously entertained by the Ministry, for the very consideration of a revision is now deferred for another session, that the country may be thoroughly sounded on the question. The duties on bar, hoop and sheet iron, as well as those on puddled bar and wrought scrap were expected to be altered, and strong representations were made to the Government of the anomalous and unfair effect of these duties upon manufacturers who used the three first-named classes of iron as material. Barb wire also bears a duty that increases in unpopularity. From the Northwest, where there is no other fence material used but wire, there were numerous vain petitions for the removal of the duty upon it. The duty was lowered from 25 to 12½ per cent. on binder twine. A measure was passed to amend the Internal Revenue act, so as to allow of petroleum being carried in tank cars. This has affected the price of both Canadian and United States oil very appreciably.

A Dominion insolvency act was expected this session. The leading boards of trade of the country had jointly drafted a bill for submission to parliament a year ago, but it was carried over to this session. It never found its way before either house. The commercial treaty with France, though signed by Canada's representative and agreed to by the British and French governments, was not ratified by our parliament.

The arraignment of the tariff as the parent of combines, was a disadvantage against which schemes of commercial amalgamation had to struggle this session. The merging of the three sugar refineries of Nova Scotia was fraustrated by the commerce and railways committee, but it is expected that the Legislature of Nova Scotia will give the required charter and incur the risk of federal disallowance. Efforts were made to bring the disallowing power into operation to dissolve the monopoly granted by the same Legislature to the Dominion Coal Company, better known as the Whitney Syndicate. The bill of the Canadian Gas Association was very greatly modified in committee in favor of municipalities.

The high rates of interest ruling in New York have caused the movement of considerable quantities of money from Montreal and Toronto to that market. Some of our banks that have branches in New York, and others that have agencies there, created a flutter in stock speculating circles by suddenly withdrawing all call loans for the purpose of shipping money to New York. This caused a sharp spell of realizing, and several stocks went down in consequence.

St. Lawrence river navigation is likely to open much later this spring than it did last year.

The quantity of the Scotch and English pig iron imported into Canada grows less every year. The competition of United States iron is displacing it very generally in the West. British iron can be laid down in Montreal at prices equal to or probably lower than United States iron can, but at points further inland the advantage is in favor of the American iron. Thus the internal freight is a determining factor in the competition between the two irons. It is expected that dullness in the shipping trade this spring may benefit the British iron in the Canadian market. But comparative cheapness is not the sole advantage in favor of American iron. Convenience is a matter of still greater moment. Consumers have to order British iron in large quantities and to pay for it at once. On the other hand they can limit their orders of American iron to a carload, and can get it in ten days at the furthest. Thus they save interest and storeroom. The difference in methods of grading British and American iron is said also to secure greater uniformity in the quality of the latter than is usually found in the former.

Some enterprising traders made a little money this season by importing galvanized, annealed and oiled and annealed wire from the United States. The disparity between the prices ruling on the two sides of the border afforded the chance which enabled this to be done. Our manufacturers had lowered the price in the staple sizes last fall, but evidently not enough to effect the purpose aimed at—namely, the exclusion of wire from the United States. They made a further reduction a few weeks ago, but in the interval a good deal of wire had been brought across the line. Even since the latest reduction there has been some importing done. Hardware jobbers were unable to avail themselves of the cheaper prices of outside manufacturers, as by importing they forfeit a rebate which is held back by the associated Canadian manufacturers. The jobbers were consequently considerably chargined to see the trade in wire passing into the hands of other traders who were not in the compact with the Canadian manufacturers.

The report that a Boston syndicate had secured options on all the smelting works, rolling mills and steel plant in the Maritime Provinces, and were negotiating to purchase the three rolling mills of Montreal, is denied in its relation to the Montreal works.

Ten cars of machinery for the extension of the trolley car system in Toronto arrived a few days ago from Providence, R. I.

The Gurney Foundry Company of Toronto recently placed an order for 2000 tons of Tonawanda pig iron.

The trade in white lead, which has been sadly demoralized for some months by cutting among the grinders, is now on a satisfactory basis, the manufacturers having entered into an agreement to keep the price of pure lead uniform.

The plate glass jobbers of Toronto have revived their association.

The Doty Engine Works Company, Toronto, have been running till ten o'clock every night since the beginning of the year with the view of being able to get all their contracts out on time. This company is identical in composition with the firm of Bertram & Co., wholesale hardware merchants in Toronto. They have numerous orders on hand for constructing Roberts' Safety Water Tube Boilers, which they manufacture under license from the patentee.

A novel application of aluminum was made by a Toronto hospital surgeon a few days ago. A patient had an enormous swelling on the abdomen which it was necessary to treat with electricity, but for some time no metal for the current could be found light enough to be borne by the patient. At last the surgeon concluded to try a spiral of aluminum wire, and the operation was a success.

W. H. Banfield & Co., Toronto, have imported 8 tons of aluminum sheets within a few weeks. The firm manufacture dog tags, systems for ladies' dresses, paper cutters, street numerals, travelers' sample tins, and numerous other articles from aluminum.

The manufacturers of cut nails say that this spring sales have fallen off very perceptibly from last spring's volume. Wire-nail men speak with satisfaction of the season's business so far.

John Inglis & Son, Toronto, are making a large evaporator for the new salt works that are being built at Windsor, Ont. Another contract the same firm have in hand is the making of the boilers for a large vessel that is being built for the North Shore Navigation Company to ply between Owen Sound and Chicago in time for the World's Fair.

The manufacturers of agricultural implements and machinery are consuming more than the average amount of material. The two successive good harvests reaped in Manitoba and the Northwest have given a special impulse to business from those quarters.

The Northey Mfg. Company, Toronto, are putting up a large building in the west end of the city. Their steam pumps and condensers are in wide demand.

The long drawn out strike of Hamilton, Ont., molders appears likely to terminate in an unconditional surrender, as since the International Iron Molders' Union has stopped its remittances the molders are treating more reasonably for resumption of work. They have been on strike 14 months and their play spell has cost the International Union $30,000.

A syndicate of capitalists is negotiating with the Toronto city council for a lease of an abandoned pumping station, on the site of which it proposes to erect rolling mills. The conditions named have so far been favorably received, and it appears certain that the industry will be established.

Though mining machinery has been three years on the free list, and though another extension of three years has been given to its free admission into the country, yet the condition that privilege is subject to makes it a matter of annoyance to importers. The condition in question is that it shall not be of a kind similar to what is made in the country. The officious officialism of collectors is fully exercised in this matter, and the privilege is often endangered, or enjoyed only after much trouble has been caused.

The Killey Bee Rett Engine Company, Hamilton, Ont., have sent to British Columbia a 100 horse power engine to be used in a big sealing steamer.

The Eureka Currendrum Company has bought mining rights in the township of Pittsburg, Ont., for twenty-five years, the consideration paid being $150,000.

The owners of mica property near the city of Kingston, Ont., are turning up some very fine samples. A considerable amount of shipping has been done to United States points and to England.

Captain Jewell, U. S. A., and Lieutenant Richards, retired, superintended the loading at the test of the Lefever Bremner dynamite shells at Onondaga Valley, N. Y., on the afternoon of March 24. The first shot riddled the target at a distance of ¼ mile. Four shells were fired. The test is reported to have been a complete success.

THE WEEK.

The irrigation enterprises in the arid district of Arizona comprise a system of canals which will cost $10,000,000. The main ditch is to be 150 miles long and 112 feet wide at the bottom. The area to be irrigated is about 6,000,000 acres.

Swift's former butcher's shop in Cape Cod has expanded to a business that now exceeds $90,000,000 per annum.

Three hundred boys from English slums have been sent to farms in Canada.

The East River gas tunnel has penetrated hard rock, encouraging the expectation that compressed air, which has been fatal to laborers in three instances, can be dispensed with.

Far up on the Yucon River, in Alaska, a variety of garden vegetables has been cultivated with success.

That the skilled labor market in England continues in a very unsatisfactory state is proved by the last reports of the labor correspondents of the British Board of Trade, published in the *Board of Trade Journal*. The engineering and building trades are the only ones that show any improvement over the month of January, and that but slight. Of the reports of 23 trades unions rendered, 13 describe trade as "bad," 6 as "moderate," and only four as "good;" facts which prove the continued depression.

A colony of 2000 Waldensians, refugees from Italy, will soon remove to 12,000 acres of land purchased in North Carolina, where there is promise that they will become valuable citizens. Lumber for their dwellings is being prepared.

Grave questions relating to the efficiency of quarantine regulations are raised by the landing at Halifax of emigrants bound to the United States.

The agriculturists in Kansas and Minnesota, who are legislating to prohibit contracts payable in gold, are said to have in view the expulsion of loanable capital from the State. They have yet to learn that experience is a hard teacher.

An investigation of the affairs of the bankrupt Lombard Investment Company of Boston is said to show how a concern enjoying high repute may at the same time be entitled to no higher commendation than that of rare skill in deceiving the stockholders.

Frenchmen want to build a ship canal to the Mediterranean, so that it shall not be necessary to pass through the Straits of Gibraltar.

Honduras is engaged in slaughtering her own citizens as a means of promoting the general welfare. In Southern Brazil the same tactics are adopted. The greater the victories achieved the greater the disaster.

Cholera is quite destructive in several parts of Russia and Austria.

Ice on Lake St. Clair, Mich., is the thickest in 20 years.

Chinamen are entering this country surreptitiously both from Mexico and Canada. The Chinese wall proves to be ineffective.

Prospects are that cholera will soon become epidemic in remoter Europe.

The temperature in Cuba often touched 90° last month.

Refugee negro emigrants, who have been passed along to the next town until they find themselves on the Western frontier, are now planning to go to Brazil to work coffee plantations.

Cotton planting in the South has become quite general, and in Texas the acreage will be increased. The "Lone Star" State may grow one-third of the entire crop.

The Pennsylvania Legislature has appropriated $625,000 for a fire-proof State Library building.

There is not a wagon factory in all Mexico.

A new labor organization is spoken of, to be composed of members of five organizations of railway employees now in existence. Eugene Debs of Terre Haute, Ind., leads in this new departure and has selected an Executive Committee. One of the prime purposes in view is to abolish strikes and to maintain harmonious relations. The standing Grievance Committees, which Mr. Debs says have been a fruitful source of unrest and discontent in the past, will have no place in the new scheme. There will be no secret sessions and no mystery. Committees will be appointed to consider grievances and report to the Board of Directors. If there is any trouble about wages or any other matters, no effort will be made to adjust it until after the World's Fair.

Samuel Gompers of the American Federation of Labor assures his audiences that at the present rate of organization they will soon be able to cope with trusts and monopolies.

A bitter struggle has arisen in this city between the Clothing Manufacturers' Association and their men who are locked out. The manufacturers comprise 30 of the largest firms, and allege that the men have "combined and conspired together" to boycott their goods, threatening to destroy their trade. Circulars warning merchants throughout the country against handling the goods have been sent out. The manufacturers, through Judge Lawrence of the Supreme Court, caused summonses to be issued restraining the defendants from interfering with business by ordering boycotts or otherwise performing acts damaging to trade. The Federation, it is said, will appeal to the United States Supreme Court.

Crematories for burning garbage have proved so successful in Savannah, Lowell and some other places that Boston and Chicago are considering this mode of disposing of their refuse. The Lowell crematory, which cost only $10,000, proves adequate to all the demands of the city. In New York the garbage question is as far from a satisfactory solution as ever.

Judge Ricks of Toledo is informed by a man prominent in labor organizations that his decision to the effect that general strikes are "a combination in restraint of trade," has prevented a tie-up throughout the length and breadth of the country.

The hearing in the suit of Coxe Bros. & Co. against the Lehigh Valley, charging discrimination in freights, has been postponed again, and some people believe that it will not amount to anything.

Honduras is doing much to encourage Americans in the banana trade, but local revolutions work contrariwise.

California oranges were sold in England in prime condition at $3.50 a box.

Cheaper silver is making mischief in Cuban trade as well as in Mexico and India.

Herr Krupp, the great gun builder, is said to pay a tax of $32,400 yearly on an income of $1,095,000.

Arrangements have been made by the Pennsylvania Railroad for the prompt delivery in New York of perishable freight from Florida and other Southern points within 48 hours after leaving Charleston.

The placing of dynamite in the hold of the British steamer which arrived at British Columbia from San Francisco is an act attributed to the Seaman's Union, and is worthy of those who poisoned the steel workers at Homestead.

Phil. D. Armour, the Chicago meat packer, employs over 16,000 men and boys.

The good will of the New York *Times* is believed to have been sold for $950,000, and that of the *Mail and Express* for about half that amount.

The ordinances providing for various trolley lines in Philadelphia have all been signed by the mayor and contracts for machinery and materials are already in course of execution.

The Chancellor of New Jersey finds that the Central Railroad has severed its connection with the combine and complied literally with orders for dissolving the lease.

The deal trade of St. John's, New Brunswick, is threatened with extinction by a strike for higher wages by the ship laborers who handle cargoes.

California wheat prospects were never better at this season of the year.

Railroad corporations, not content with monopolizing the lake front at Buffalo and controlling elevators along the entire line of the canal, are now attempting to "freeze out" the canal boats from their old-time rendezvous on the East river in New York.

The Government abandons the proposed Custom House site on Bowling Green, New York was bowled out, as it were.

Already raisin growers in California complain of over-production; wine is sent away in shiploads; oranges are in sharp competition with Florida, and yet the Pacific coast fruit trade has just begun. The great drawback is high freight rates.

Fertilizer and phosphate interests in the South have taken a new start, the product being sold in advance at profitable rates.

A sad tale is furnished by the police record respecting a once prominent iron merchant in John street, New York, who was charged with stealing a loaf of bread.

This time it is a conspiracy in Costa Rica.

An Italian engineer in Milan is making hydrogen at a cost of 1 cent per cubic meter; so it is reported.

There are four steamship lines, comprising 70,000 tons, in the trade between New York and the Mediterranean. Twenty-five years ago America had at least thirty sailing vessels in the trade, all of which have disappeared.

Every day or two during the windy month of March steamships in the Atlantic trade have experienced a broken shaft. The latest misfortune occurred to the Heckla of the Thingvalla line.

Ocean freights in San Francisco are lower than ever before, so that ships are leaving in ballast.

The production of beet sugar in the United States more than doubled during the past year, although there was no increase in the number of factories.

After surveying the crop situation through the entire Northwestern wheat belt, the Minneapolis *Market Record* says: "It does not appear that the winter wheat crop is so much hurt as many would have the country believe."

Boston is worried lest the Boston & Maine Railroad, as well as the New York Northern, fall into the control of the Vanderbilt party and so get cut off from an independent connection both with New York and the West. The question is asked: "Is Boston to be bottled up?"

The Iron Age

New York, Thursday, April 6, 1893.

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CHAS. KIRCHHOFF, - - - EDITOR.
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RICHARD R. WILLIAMS, - - HARDWARE EDITOR.
JOHN S. KING, - - - - BUSINESS MANAGER.

The Consumption of Rails.

The hesitancy which characterizes the steel-rail market is prompting much inquiry into the conditions which have prevailed in previous years. By way of contributing to the store of information which should be in the possession of those interested, we have compiled the following table of the net annual increase in railroad mileage, the total annual domestic production of all kinds of rails, the annual importation of all kinds of rails, and the approximate annual rail consumption, from 1870 to 1892, inclusive:

Years.	Miles of railroad built.	Production of all kinds of rails. Gross tons.	Annual imports of rails. Gross tons.	Approximate consumption of rails. Gross tons.
1870.....	6,078	553,571	356,387	909,938
1871.....	7,379	692,619	505,538	1,198,157
1872.....	5,878	802,857	473,973	1,366,830
1873.....	4,097	794,711	231,047	1,025,758
1874.....	2,117	651,261	90,706	74 ,967
1875.....	1,711	707,599	17,364	724,963
1876.....	2,713	785,383	256	785,639
1877.....	2,280	682,776	31	682,807
1878.....	2,679	788,111	9	788,120
1879.....	4,817	993,993	39,417	1,033,410
1880.....	6,712	1,305,212	259,544	1,564,756
1881.....	9,847	1,646,518	344,929	1,991,447
1882.....	11,569	1,507,851	200,113	1,707,964
1883.....	6,743	1,214,905	34,801	1,249,706
1884.....	3,924	1,022,088	2,829	1,024,917
1885.....	2,982	976,978	2,189	979,167
1886.....	8,014	1,600,537	41,588	1,642,125
1887.....	12,878	2,139,640	137,829	2,277,469
1888.....	6,916	1,403,700	56,280	1,459,980
1889.....	5,146	1,522,204	5,551	1,527,755
1890.....	5,498	1,885,307	182	1 885,489
1891.....	4,262	1,307,176	253	1,307,429
1892.....	4,200	1,500,000*	347	1,500.347*

*Estimated.

The period above given comprises what may be considered the era of really great railroad expansion. Up to within a very few years prior to 1870 the progress made in railroad building was astonishingly slow, as compared with the very rapid strides accomplished so easily in the years following. It is, therefore, unnecessary to go further back than these figures except for historical purposes. The growth of the domestic production of rails and the fluctuations in imports are shown in interesting form. The annual consumption of rails, obtained by adding production and imports, is stated to be only approximate, because rails are not always laid as soon as purchased, so that the consumption may really run into another year. There are also some rails exported, which have not been taken into consideration, as the quantities are not large enough to seriously affect grand totals.

In presenting this table attention is particularly called to one point. The figures show very conclusively that the demand for rails is not to be gauged closely by the activity in new railroad construction. A mere cursory examination suffices to demonstrate this. For instance, in 1890 there were 1500 miles less of new track laid than in 1888, and yet the consumption of rails was larger by nearly 430,000 tons. In 1892 the mileage was some 2700 miles less than in 1888, while the consumption of rails was somewhat greater. New construction in 1892 was about the same as that of 1891, but the consumption of rails in 1892 was some 200,000 tons greater. The prosperity of old roads is evidently more important now than new construction, and probably will continue to be until some wildly speculative era of railroad building again sweeps over the country. There is a disposition to stimulate railroad construction in some sections, which may or may not amount to something of consequence. Bonds are again being voted by towns and counties to secure desired railroad connections. The success of a few schemes of this character may influence others and bring about fresh activity, which would, of course, be welcomed by the rail mills. Meanwhile, however, their best trade will come from old roads laying a second, third or fourth track, or replacing partly worn light sections with heavy rails, or making absolutely necessary renewals.

Competing With England.

Judging from the tone of London papers when remarking upon the change of flag upon two of the Inman International steamers, not a few Englishmen seem to regard the act as almost impertinent, and to attempt in America to build steel vessels to run in competition with British steamers is little short of audacity. The remarks of the London *Economist* on this subject, while betraying a feeling akin to jealousy, are in one sense amusing, at the same time conveying a certain amount of unwelcome truth. The writer speaks of "a new departure in transatlantic navigation," and proceeds to say: "The United States cannot for a moment hope to compete with British-owned and British-manned ships on their merits. It has been proved to the hilt that it is quite impossible for American shipbuilders to produce tonnage as cheaply as English bottoms are manufactured. They require to pay almost twice as much for their principal materials to begin with. Steel plates can be bought for £7 per ton in England, while they cost nearly as much again on the Delaware and the Schuylkill. Not only so, but the cost of the labor employed in an American shipyard is very much greater than the cost of labor in an English factory or workshop of the same character."

It would be vain to deny that Americans, in entering the lists a second time to dispute the maritime supremacy of Great Britain, meet a foe worthy of their steel. The writer above quoted affirms unequivocally that steel plates cost nearly double on the Delaware what they do in England, and asserts with the same confidence that the average wages of American seamen are nearly twice the average earnings of British seamen. Starting from these premises the conclusion is reached that "Americans cannot compete, even under equal conditions." In support of this view reference is made to the experience of Germany. The North German Lloyd, we are told, should they lose money during the remainder of their fifteen years' contract as fast as they have during the first three years, will have sunk a total of $10,000,000. The parties concerned not unnaturally wish to be released of their obligations.

Possibly the London paper assumes too much; but in regard to the relative cost of steel plates in America and England the fact must be conceded that the difference at present is about as represented, the quotation being 1.15 cent per pound delivered in the Tyne, Wear or Mersey, as compared with 1.70 in Eastern Pennsylvania. Here is an important factor in any calculation that may be made; but in American eyes it is full of encouragement, because demonstrating the marvelous progress made in steel shipbuilding in the United States within a very brief period and presaging triumphs that cannot be remote. It is the long stride made toward the attainment of a definite end that enables American mechanics at the present date to make engagements which, a few years ago, would have been arrant presumption; and the steps taken are progressive. There will be no cessation of endeavor until American shipyards stand unrivaled. Our London contempory says, in pursuing his argument, "there is no doubt that the higher range of wages generally paid in the United States conduces to higher efficiency, and in many American industries the output is greater relatively to the number of hands employed than in the same industries as carried on in England. But, although it is possible that the American marine may be fitted with somewhat more effective labor-saving appliances, it would be an error to suppose that this greater effectiveness, if it exists, would be sufficient to compensate for the higher rate of wages."

Here, too, as in the previous quotation, there is a large modicum of truth. Undoubtedly the superior mechanical appliances constantly introduced by American shipbuilders conduce to higher efficiency and yield better results than were ever before realized or even possible. The fact is seen and acknowledged. The most practical and incisive comment on the reluctant confessions and dismal forebodings of the British organ is found in the achievements of the new cruiser "New York," which on the contractor's trial developed as high as 20.38 knots per hour with 126 to 120 revolutions. True enough, the British have done better, their new cruiser "Blenheim" having made 21.6 per hour with 165 revolutions, and the "Blake"—lately the Admiral's ship—has done almost as well. The Yankees, however, are still climbing, and eventually will not be left far behind.

It has been said that this year is one which will develop a good deal of activity in the purchase of rolling stock by the railroads, and that no heavy buying of track material can be expected until next year. Some color to this view is given by the large amount of business recently closed by car builders, and the considerable orders now in the market. A recent issue of the *Railroad Gazette*

records orders for about 20,000 freight cars, of which 10,000 were taken by the Pullman Company for the Reading, while the others are inquiries from a number of Eastern and Western roads, in lots ranging from 500 to 2000 each. This of course means a heavy consumption of iron and steel in different forms.

Gray's Telautograph.

If expert electricians are not wofully mistaken, another very important aid to the facilitation of business has been perfected. Professor Elisha Gray, of Highland Park, Ill., after six years of constant experiments, last week exhibited his apparatus for transmitting by wire a *facsimile* of anything written or drawn, the apparatus being of such a simple character that a skilled operator is not necessary. It is claimed that every obstacle which has hitherto defeated the attainment of this long-sought process has been surmounted, and that the apparatus is ready for introduction into practical every-day use. It is styled the telautograph. A transmitter and a receiver are used, each somewhat smaller than a type-writing machine. The transmitter and receiver stand side by side. In sending a message an ordinary lead pencil is used, near the point of which two silk cords are fastened at right angles to each other. These cords connect with the instrument, and, following the motion of the pencil, regulate the current impulses which control the receiving pen at a distant station. Ordinary paper five inches wide, arranged on a roll attached to the machine, is used by the writer. The receiving pen is a capillary glass tube placed at the junction of two aluminum arms. This glass pen is supplied with ink, which flows from a reservoir through a small rubber tube placed in one of the arms. The electrical impulses coming over the wire move the pen of the receiver simultaneously with the movements of the pencil in the hand of the sender. As the pen passes over the paper, an ink tracing is left, which is always a *fac-simile* of the sender's motion, whether in the formation of letters, words, figures, signs or sketches. Apparently, the only limit in reproduction is that of stenographic characters, as the machine makes but little distinction between heavy and light lines.

Assuming that the telautograph is now in as good condition for practical use as was the telephone when first brought out, a magnificent range of possibilities is presented. Private wires for the transmission of messages can be furnished business offices as easily as telephonic communication is now established. A business man can receive and transmit his own messages without the interventien of a messenger boy and also without having them pass under the scrutiny of two or more telegraph operators. Further, not only does he secure secrecy, but he also obtains a record in black and white of his telegraphic correspondence, including exact reproductions of the communications sent by the party at the other end of the wire. The telegraph and telephone may not be superseded, as they have their uses; but the telautograph steps in to occupy a field which neither of them can cover. As the receiver works without any attention, persons having telautograph connections can be furnished with dispatches or messages at any time, day or night, which will be appreciated by those who occupy their offices irregularly.

The *fac-simile* of the original writing of a message which is provided by the telautograph will avoid many disputes and mistakes arising in the transmission of communications by our present system. Even the identity of the writer or sender is thus preserved and can be traced by those familiar with his penmanship. Contracts in much more satisfactory form can be made in this way than by telegraphic message or telephone, and it may not be necessary to add, as now "Please confirm by mail."

Dear Building Material at Chicago.

All classes of building material, except iron and steel, have greatly advanced in price in the vicinity of Chicago on account of the heavy demand created by preparations for the World's Fair. Brick, lime, stone and lumber are all considerably dearer than they were a year since. The most notable rise seems to have taken place in sash and doors and inside trimmings. Discounts on manufacturers' lists which were 65 per cent. last spring are now only 40 per cent., showing an advance of over 70 per cent. on the net price then realized. The World's Fair demand has been a grand harvest for these manufacturers, whose trade had previously suffered most keenly from overproduction. It is now feared that the sudden curtailment of this demand, which will take place in May or very shortly thereafter, will have a disastrous effect. Numerous building projects, however, have been deferred for this very reason, and the building trades of the Northwest may be sufficiently well employed on miscellaneous work during the summer to counteract to a great extent the expected depression following the World's Fair rush.

A Wisconsin Strike Law.

Anti-Pinkerton legislation continues. The following bill passed the Wisconsin Senate on March 31:

The use or employment of bodies of armed men to act as militiamen or peace officers who are not duly authorized or empowered to act in such capacity under the laws of this State is hereby prohibited and declared to be unlawful; and no person, firm, company or corporation shall hereafter use or employ any such body of men to act in the capacity aforesaid for the protection of person or property or for the suppression of strikes within this State, whether such armed men be employees of detective agencies (so-called) or otherwise. Any person who as officer or agent of any firm, incorporated company or corporation aids or assists in the employment of such armed men shall be deemed to have employed the same within the meaning of this act. Any person found guilty of violating the provisions of this act shall be deemed guilty of a felony and shall be punished by a fine not exceeding $1000 or by imprisonment in the State Prison not more than three years nor less than one year, or by both such fine and imprisonment.

The statement is made that under this bill an employer cannot protect his property even with his own employees. The labor leaders are apparently securing just such legislation as they demand. Conditions may be so happy for some time that serious labor troubles will not visit Wisconsin. But it is too much to expect, with the infirmities of human nature governing many manufacturers and labor leaders, that there will always be peace. When a conflict does come, some competent force will be supplied, as in other States, for the protection of property. Despite disabling acts of legislatures, there is always a reserve power in the State itself which forms part of the fundamental principles of government. Otherwise there is no government, but a state of anarchy.

OBITUARY.

FRANCIS WEDGE.

On March 14, Francis Wedge, president of the Griffith & Wedge Company of Zanesville, Ohio, died. Francis Wedge was a native of Fernhill, Staffordshire, England, where he was born January 12, 1825. He learned the trade of machinist with Sir Joseph Whitworth, Manchester, and in 1848 came to America, going first to Zanesville to superintend the placing of machinery in the rolling mill which was then building there. Subsequently he associated himself with John H. Jones in the Blocksom foundry, and afterward became master mechanic of the Blandy shops. In 1858 the firm of Griffith & Wedge was organized, developing gradually a very extensive business in engines, saw mills and mining machinery. When in 1884 Mr. Griffith died, Mr. Wedge purchased his interest and organized the present company, assuming the presidency and carrying on the entire management.

HIRAM BERDAN.

Gen. Hiram Berdan, inventor of the famous Berdan range finder, torpedo and rifle, died suddenly at the Metropolitan Club in Washington on March 31. General Berdan was born at Plymouth, Mich., about 70 years ago. In June, 1861, he was authorized by the War Department to organize the First United States Sharpshooters, known as Berdan's Sharpshooters throughout the war. Starting as Colonel of his regiment, Berdan proved himself a most excellent soldier and officer, and retired from the service in January, 1864. On March 13, 1865, he was breveted Brigadier General of Volunteers for bravery at Chancellorsville, and on the same day was given the rank of Major General of Volunteers for his services at Gettysburg.

General Berdan's best known invention was the metallic cartridge now in such general use, the reinforcing cup being his particular improvement. Many of his inventions have been incorporated in the Springfield rifle, and a year ago the Court of Claims gave him a judgment for $100,000 against the Government for infringements. The Berdan rifle has for several years been the arm of the Russian Government, and other European countries have adopted variations of the same model. He also invented a range finder and several torpedoes and torpedo boats designed to evade nets. He also made a distance fuse for a sharpened shell.

Immediately after the war General Berdan worked with the Remingtons, but had difficulties with them, and left to establish the Berdan firearm manufactory.

OTHANIEL PRESTON.

Othaniel Preston died at Hornellsville, N. Y., March 27. He was born in 1812, where the city of Rochester now stands.

He grew up on a farm, gained an education by diligence, and was afterward engaged in a number of mercantile pursuits until his removal from Howard, N. Y., to Hornellsville in 1874, at which time he formed the Hol ow Cable Mfg. Company. Great success followed his manufacturing interests.

PERSONAL.

Sir Benjamin Baker, vice president of the British Institute of Civil Engineers, will represent that institution at the Engineering Congress, to be held in Chicago during the week commencing July 1.

Francis T. Peacock has severed his connection with the Covington Machine Company of Covington, Va., to accept the position of engineer for the United States Car Company of Anniston, Ala.

Samuel O. Gleason has been chosen treasurer of the Walter A. Wood Mowing & Reaping Machine Company of Hoosick Falls, N. Y. Soon after the death of Willard Gay, who was treasurer of the company, P S. Macgowan of Hoosick Falls became the treasurer, but his connection with the Minneapolis Harvester Works, which are an outgrowth of the Hoosick Falls establishment, compelled his resignation from the office of treasurer.

F. T. Aachman, Professor of Chemistry at the Pittsburgh College of Pharmacy, has opened an office and laboratory in the Smeltz Building, corner Water and Market streets. Analyses, assays, sampling and reporting on iron ores and product of furnace and mill, and consulting and advice on chemical processes and manufacture will be the work carried on in the new laboratory.

Robert McAfee, for some years general manager of the Lower Mills of the Oliver Iron & Steel Company, Allegheny, Pa., has resigned his position to accept the position of Chief of Public Works at Allegheny. Upon severing his connection with his old firm Mr. McAfee was presented with a gold watch and chain by the men who were formerly under him.

There are six cases growing out of the Ann Arbor strike now in the United States Court. The first is that of the engineers and firemen of the Lake Shore, on the charge of contempt of court. The second is that of the restraining order granted by Judge Ricks at Cleveland early in the struggle, and which prevents the connecting railroads in Toledo from refusing to accept the freight from the Ann Arbor, and is based upon the provisions of the Interstate Commerce law. The third is that granted by Judge Taft at Detroit, restraining Chiefs Arthur and Sargent from issuing or keeping in force any order which they had already issued to employees of any railroads to refuse to accept the business of the Toledo & Ann Arbor Railroad. The fourth injunction was that ordering Chief Arthur and Chairman Watson, of the Lake Shore, to bring into court any order or rule or regulation of the Brotherhood of Locomotive Engineers which was the basis for ordering a strike or a boycott. The fifth is the restraining of about 100 employees of the Wheeling and Lake Erie Railroad from refusing to accept or handle the freight or cars of the Toledo & Ann Arbor Railroad Company. The sixth is the suit for $300,000 damages, filed by Manager H. W. Ashley of the Ann Arbor road, against Chiefs Arthur and Sargent, based on the strike and the refusal to transfer freight to connecting lines.

An order for 400 electric motors for the Atlantic Avenue Railroad, in Brooklyn, amounts to $1,000,000.

Washington News.

(From Our Regular Correspondent.)

WASHINGTON, D. C., April 5, 1893.

Chairman Springer, who has been in frequent conference with Secretary Carlisle on the subject of his new tariff bill, said to-day that he has the measure in such shape that if the President should call an extra session on May 1 he would be ready to submit it as soon as the Committee on Ways and Means was appointed. The talk about Mr. Springer and Mr. Holman being removed from the chairmanships of Ways and Means and Appropriations, and of certain demands made by the President to govern the action of Speaker Crisp as the price of his re-election, is simply the utterances of uninformed or irresponsible persons writing from Washington. Mr. Crisp will be re elected Speaker, and both the gentlemen above named will be at the head of their old committees. Mr. Springer was severely criticised by certain tariff reformers of the Mills' school for adopting the tentative plan, instead of formulating a general tariff revision bill. Mr. Springer said to the correspondent of *The Iron Age*: "My chief reason for adopting the course was that it would be useless to attempt to bring forward a general measure, as it would be impossible to get it advanced beyond the House. Many of the tentative bills were passed by large majorities, they receiving the solid Democratic vote, North, South, East and West."

All the articles in these tentative bills have been incorporated in the bill now being prepared, which, having been considered and passed upon, will not be likely to take up any considerable time in the discussions of the new measure. Although there was considerable opposition to Chairman Springer's plan of operations, it was approved by David A. Wells and others of his school, who held that it was the most feasible method of reaching results. The increased free list in the Springer bill includes wool, lumber, salt, binding twine, coal, iron ore, and all other raw material entering into the more advanced stages of manufacture.

There will be a large reduction in manufactures of woolens and cottons. The Democratic idea which the President approves relates more particularly to free raw materials. He regards this as one of the progressive stages in the ultimate reform of the tariff on the scale of lower duties. This being the Administration idea, the bill follows that line and will receive the prompt and cordial indorsement of the President.

The new bill scales down the duties on all manufactured articles.

The metal schedule will have some radical modifications. There will be a reduction along the entire line, including steel rails, pig and structural iron, blooms, castings and all other branches, with cotton ties on the free list. The tin plate provisions in the McKinley bill Mr. Springer says have not accomplished what was expected by those who framed them. He asserts that after an experience of two years the domestic manufacture is so small that it does not supply a material portion of the American demand. The amount of tin plate consumed when the present law went into operation he claims was 650,000,000 pounds. After the exhaustion of the overstocked market and after trade had returned to its ordinary channels the imports of foreign tin plate enormously increased. The chairman says that the uses of this article have so greatly increased in manufacture of canned goods of all descriptions in the United States that the output of the home plants will be entirely inadequate. It is estimated that the amount of imported tin in the next year will reach 800,000,000 pounds, instead of 650,000,000 pounds when the McKinley bill went into operation.

It is proposed to incorporate some legislation which will be fair to the tinning industries and will modify the McKinley five years' provision. If the McKinley bill is repealed as a whole, which is the object of Mr. Springer and his party, it is believed that these tin plate provisions will go with it.

This bill will be in readiness to be submitted as soon as the Fifty third Congress is organized and the Ways and Means Committee appointed.

Iron in Colombia.

A British consular report recently referred to the iron works which are being carried on in the neighborhood of Bogota, Colombia. The Praderas Iron Works, belonging to the Variga family, situated on the plains about 40 miles east of Bogota, are said to have been working for about 12 years. These works now produce daily some 70 tons of pig iron, which is converted into all kinds of cutlery and hardware. It is said that even small locomotives are manufactured at this establishment. The works at Pacho, situated about 45 miles to the northwest of Bogota, were originally founded by Robert Bunch some 50 years ago, and produced a good class of iron and rails of light weight The ore, brought from a short distance, appears of good quality, and fuel is abundant. These works are now closed, as the Pradera Works, possessing better facilities of communication, can produce as good an article at a lower cost. There are also some works erected at Samaca; these also are no longer working. The ore proved of excellent quality, but the quantity was so small as not to be able to be worked profitably. The Government of Boyaca has spent $432,000 on the foundry and buildings and the development of the mine.

It is reported that the first convention of the Finishers' Union of Iron & Steel Workers will be held in Youngstown, Ohio, early in June. As yet nothing has been done looking to the wage scale which will be presented to the manufacturers governing wages for the year commencing July 1, 1893. It is the impression in some quarters that a truce will be patched up between this organization and the Amalgamated Association of Iron & Steel Workers, and if this occurs, a consolidation of the two bodies will probably take place.

Judge Billings of New Orleans has rendered an opinion that the cars of the Pullman Palace Car Company are assessable. The property of the company cannot, however, be taxed as permanent property.

Proofs of the increasingly depressed condition of the English iron trade continue to appear in the London papers. *Iron* says that a committee of three ironmasters and three mine owners has been appointed by the ironmasters and iron-ore proprietors of West Cumberland to negotiate with the royalty-owners with a view to a reduction of the royalty rents. Of the 38 furnaces in the district 12 only are in blast, while three out of five large steel works are idle. The introduction of the basic process in the making of steel is said to be the cause of the paralysis, and it is the unanimous opinion of the smelters and mine owners that a substantial reduction of royalties is absolutely necessary to save the trade of West Cumberland from destruction.

The Brazilian Government is reported to have let a contract for 70,000 rifles to a Berlin (Germany) firm.

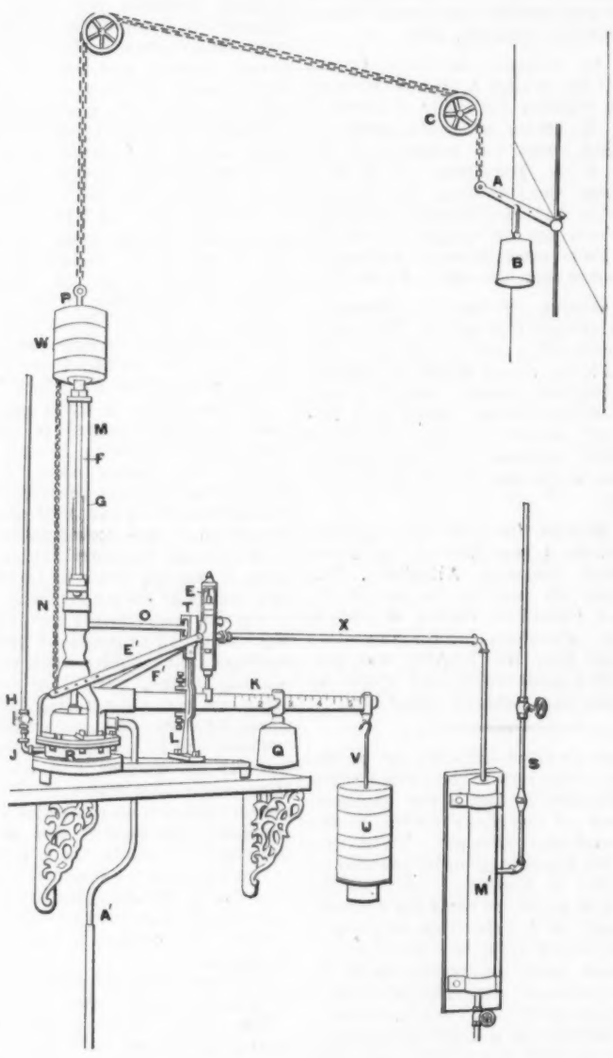
The Locke Steam Damper Regulator.

Locke Brothers, of Salem, Mass., the makers of this regulator, claim that it will handle a larger number of dampers and heavier ones than any other ; that it keeps perfectly even steam in the boilers, often holding the pressure on large plants within ¼ of a pound for hours, moving the dampers (as shown in the report of a test made by George H. Barrus) with ⅛ of a pound variation in pressure, keeping even heat under the boilers and therefore using the smallest possible amount of fuel. It operates the dampers in perfect accordance with the slightest variations in pressure. The rubber diaphragm is always covered with pure cold water and is thus kept flexible and lasting.

The apparatus is arranged as shown in the accompanying drawing. The diaphragm chamber R is connected by the pipe H with the steam pressure of the boiler at a point least likely to be affected by the vibrations of the engine. The valves are placed in this pipe, one near the regulator and the other at the boiler end or near the steam supply. It is often necessary to close both of these valves so that they will only be open, say about ¼ of a turn in a ⅜-inch pipe, and two valves are used, because with two they can be left open more than would be possible with only one. The weight B is arranged to hold the damper closed until acted upon by the regulator. After placing the pulleys and attaching the chain to the arm A, the exact length of motion required to open the damper is ascertained by drawing the chain backward and forward—then the length of stroke of the piston P is limited to the same distance. To do this the cap of the cylinder or motor M is removed and the loose piece of pipe G, which acts as a stop motion, is shortened as may be required. When the dampers are closed there is sufficient opening to permit the gas to escape, but not enough to allow the fires to run up. The piston P is weighted sufficiently to open the damper. The lever K is provided with the weights U and the poise Q. When the poise is at 20 and the weight-holder V is in the outer notch, 20 pounds of steam will be maintained in the boilers; then weights can be added to balance the pressure required. The set screws in the port L are kept far enough from the lever K to allow it to rise high enough to open the passage through the valve T for the water to pass and raise the piston P, and low enough to close the inlet port and open the exhaust port and allow the water in the motor M to pass off through the pipes O F' A'. When the piston rises, it carries up one end of the lever E' attached to it by the small chain N. This rotates a cam in the top of the port L and raises the body of the valve T, and tends to close the port of the valve and check the upward movement of the piston, which otherwise might move the whole stock when unnecessary. Having all the pipes connected and the valve in the pipe S from the mud drum M' open, and the lever K weighted to give the desired pressure, the operation is as follows: If the steam pressure increases just enough to overcome the weights on the lever K and raise the lever, water is thereby admitted to the motor M, raising the piston P and allowing the damper to close sufficiently to check the fire. If, on the other hand, the steam pressure falls off, the lever K falls and closes the inlet port of the valve T and at the same time opens the exhaust port, allowing the water in the motor M to pass down and out through the pipes O F' and A'. This lets the piston P fall and open the damper, increasing the fire.

It will be seen that the regulator is composed of a steam weigher and a damper operating motor with a valve for admission of water to the damper motor which is common to both, or is controlled by both; first it is attached to the lever of the steam weigher and opened whenever the steam at the boiler exceeds the weights on the lever, which would cause a flow of water to the motor and close the damper, but for the fact that the body of the valve is moved and controlled by being connected to the damper motor by means of a cam, lever and chain. By this connection the motor is constantly undoing what is being done by the steam-weighing device. If this valve is being opened by the steam weigher to close the damper, the damper motor after moving a short distance has closed the valve and stopped any further closing of the damper; but if the steam pressure tends to still further increase and again slightly opens the valve, the motor will move the damper again a short distance when the water is again cut off, and the damper is again held, and may be it will next be opened a trifle by a fall of pressure causing the lever of the steam weigher to fall and close the direct port of the valve, and open the exhaust, when the same operation is repeated by the damper motor closing the exhaust as soon as the damper has opened a little way. This peculiar arrangement by which the combined machines (which are distinct from each other) both operate upon the same valve to produce a common object, the placing of large steam damper in such a position as to correct and maintain any desired pressure, is unlike anything else.

Wherever introduced, this regulator has been found to be extremely sensitive and to maintain any desired pressure in the boiler with the smallest possible fluctuations. It is now in operation at the Harrisburg mill of the Lalance & Grosjean Mfg. Company, and at the new universal mill of the Central Iron Works, Harrisburg, Pa.



THE LOCKE STEAM DAMPER REGULATOR.

The Penn Steel Castings Machine Company of Chester, Pa., have just delivered to the Baldwin Locomotive Works eight steel driving wheel centers, which are to be used by them in the construction of a locomotive capable of running 120 miles an hour. It is claimed that this will be the first locomotive having steel driving wheel centers. The same concern are completing a contract for 14 cast-steel anchors for the United States Government. Ten of the anchors weigh 12,000 pounds each, and the remainder 10,000 pounds each. The anchors are each complete in one casting with the exception of stocks and shackles, which are of forged steel. They have all been subjected to severe tests with satisfactory results.

Coxe Brothers' iron coal breaker at Oneida, Pa., was burned last week. It was erected at a cost of $250,000 and was supposed to be indestructible by fire. The machinery was either destroyed or rendered temporarily useless.

Muirkirk Furnace, in Maryland, went into blast on the 3d inst.

Trade Publications.

WE HAVE RECEIVED two catalogues from Edwin Harrington, Son & Co. of Fifteenth street and Pennsylvania avenue, Philadelphia, Pa. One describes their hoists, overhead railway and traveling cranes, from 500 to 20,000 pounds capacity, and gives everything necessary for the complete equipment of a plant. Concerning the overhead tramway it is stated that "by the use of this system in our shops we are prepared to show an actual saving of 50 per cent. in the cost of labor while handling large or heavy articles, in addition to the fact that it lessens very materially the liability to accident, and it is our experience and opinion that every machine shop, factory, warehouse, &c., should be equipped with this system. With our railway, hoist and geared track two men are enabled to handle a large casting much easier than six men the old way. Another important feature is that goods can be transported about a room by raising them to clear work that may be in the path or on the floor."

The second catalogue deals with machine tools built by the company, including lathes, drill presses, planers and special machine tools. The engine lathes have large diameters of cone, with broad belt surface; hammered crucible steel spindles; bronze metal journal bearings; lead screw for screw cutting, carriage screw, tail stock, spindle screw, back shaft studs for feed works and feed rack, all of steel. Tail stock spindles clamped by adjustable conical binder; stationary or steady rests on all sizes; following rests on all sizes below 38 inches swing. All sizes have power cross feed, compound tool rest, gibbed carriage unless otherwise ordered. Twenty-inch swing and larger have extra side block for turning full swing of lathe. Thirty-two inch swing and larger have geared-face plates. Sixteen to 32 inches inclusive have two face plates. Thirty-six inch swing and larger have plates keyed to spindle unless otherwise ordered. Carriages have long arms, giving greater bearing surface, which are self-oiling, lessening the liability to cut the guides when constantly on short work. All sizes have improved geared friction feed, unless ordered for belt, so arranged that screw cutting cannot be engaged at same time as friction or turning feed. Three section cone feed gear, on end of head stock, connecting with lead screw gives a positive feed and enables a change more quickly than a belt. All the lathes have cut gearing. All centers are fitted with Morse twist drills, standard taper. The lead screws are cut from a master screw direct from the Whitworth standard, and carefully kept for proving the working screw of the screw threading lathe, and secures accuracy of screw cutting on all lathes built by them.

A. ALLER of 109 Liberty street, New York, has issued a catalogue of engineering specialties for steam, oil, gas, water and chemicals. The high efficiency and reliability of these appliances are shown by the constant and ever increasing demand for them. The following is a partial list of the machines described in the catalogue, all of which are shown in actual operation at the warerooms of Mr. Aller: Korting injectors, water and steam pressure regulators, lubricators, pumps, blowers, &c.

SCHAFFER & BUDENBERG of Brooklyn, N. Y., have arranged with Professor Carpenter of Cornell University for the sole manufacture and sale of calorimeters invented and patented by him. The throttling calorimeter proper is made of brass, nickel-plated, and consists of a small vessel to which steam is supplied through a tapering or converging orifice, and which contains in its center a very deep cup, into which a thermometer can be inserted for obtaining the temperature of the steam in the calorimeter; the calorimeter is furnished with a cock, to which a manometer can be attached for measuring the pressure in the interior. The exhaust steam is discharged from the lower part of the calorimeter, and need not be condensed; it may be conducted away in a hose or pipe, or permitted to escape into the air, as convenient.

The principle on which the calorimeter operates is as follows: Some of the heat contained in high pressure steam is liberated when the pressure is lowered, and that heat is utilized in evaporating any water the steam may contain and in raising the temperature of the steam above that due to its pressure. Thus the total heat in 1 pound of steam at 80 pounds absolute pressure is 1177 B. T. U., and that in 1 pound at 20 pounds absolute pressure is 1151 B. T. U. If, now, steam were allowed to expand, without doing work on any body except itself, from 80 to 20 pounds pressure, 26 B. T. U. would be liberated for each pound of steam. Since at 20 pounds pressure 954 B. T. U. are required to evaporate 1 pound of water, we should have additional heat sufficient to evaporate 26 ÷ 954, or 0.027 pounds. Now, if the original steam contained less than 2.7 per cent. of moisture, a thermometer placed in the steam would show a temperature higher than that due to a pressure of 20 pounds, which is 228° F. In such a case, it would be possible to compute the percentage of moisture in the steam; but if the steam contained more than the above moisture, the heat would not be sufficient to evaporate it, the reading of the thermometer would be equal to that of the boiling point for the given temperature, and no computation of the moisture in the steam would be possible. That is, a throttling calorimeter cannot be used if the steam contains much over 2.5 per cent. of moisture, but it is very convenient and accurate when it can be operated.

The separating calorimeter consists of a vessel about 12 x 3 inches, constructed so that steam in passing will be completely and perfectly separated from any moisture that it contains. The moisture is precipitated in an interior chamber, which is connected to a water gauge glass and scale, so that the amount of water can be seen and its volume of weight read off on a scale. The dry steam passes into an external chamber, which surrounds the inner chamber and forms a steam jacket, which prevents the loss of heat by radiation from the inner chamber. The dry steam and such water as may be formed in it by condensation after leaving the calorimeter is discharged at the bottom of the outer chamber through a small orifice. This steam is caught in a condensing vessel and its weight determined from the increase in volume of the original water in the condensing vessel. The scale on the calorimeter gives the weight of moisture, that on the condensing vessel the weight of dry steam.

The per cent. of moisture in the whole weight is then, evidently, the quotient obtained by dividing the weight of steam, as shown by the calorimeter scale, by the sum of that shown by the scales on the calorimeter and the condensing vessel. The quality of the steam is 1 minus this number.

The Hartford Steam Boiler Inspection and Insurance Company endeavor annually to collect statistics of the number of boiler explosions occurring from year to year and figures relating to the mortality and injuries thus caused. Although confessedly incomplete, the total figures are startling, indeed. For the year 1892, 269 boiler explosions have been recorded, against 257 for 1891 and 226 for 1890. Where more than one boiler exploded at the same time, each boiler has been counted separately, in the belief that a fairer idea of the amount of damage done could be arrived at in this manner. The explosions are classified and are arranged by months. A somewhat curious fact is brought out in the table so far as it relates to rolling mills and iron works. In all there were 24 explosions, of which 7 occurred in January, 1 in February, 3 in March, none in April, May, June, July and August; 2 in September, 3 in October, 1 in November and 7 in December; so that apparently the winter months are most fatal to this class of structures in iron manufacturing plants. The total number of deaths resulting from boiler explosions was 298, while there were injured 442 persons.

Samuel J. Hoggson of New Haven, Ct., president of the Hoggson & Pettis Mfg. Company, is the inventor of a substance which he has entitled "Colophite." It is stated that he has sold his invention to a company of capitalists who will constitute the parent company. It is expected that the business of this company will be confined to the manufacture of "Colophite" in its various forms and the preparation of Kaurie and other gums for the supply of sub-companies which will be formed to introduce and develop the sale of these products in the different branches of trade. This parent company will become a stockholder in each sub-company formed, thereby securing to itself a source of revenue in addition to the profits to be made by sales of its own products. The following-mentioned branches will require the formation of sub-companies: For manufacturing anti-crustaceous compound, for manufacturing piano and organ keyboards, &c.; for manufacturing paints, enamels, kalsomine, &c.; for manufacturing wood pulp and paper wares, for manufacturing waterproof paper, &c.; for selling anti-rust and oxidation solution, for selling anti boiler-scale compound, for selling prepared gum to varnish makers and many other industries.

MANUFACTURING.

Iron and Steel.

Bellefonte Furnace of the Bellefonte Furnace Company of Bellefonte, Pa., which has been idle for some time, will probably resume operations in the near future. It is stated that Thos. A. Shoemaker, formerly connected with the Bellefonte Central Railroad Company, will be superintendent of the plant.

The Tyler Tube & Pipe Company, Washington, Pa., manufacturers of charcoal iron and special steel boiler tubes, will soon award contracts for additional buildings and machinery, with the object of doubling their present capacity.

In all probability the consolidation of the interests of the Ætna Iron & Steel Company and the Standard Iron Company, both of Bridgeport, Ohio, to which reference has already been made in these columns, will be consummated at an early date. A charter has been granted to the new concern under the name of The Ætna-Standard Iron & Steel Company, and a meeting of the stockholders of both concerns will be held in Wheeling, W. Va., on the 27th inst. As yet no opposition has been manifested by the stockholders, and all indications point to the consolidation being consummated on the above date.

It is stated that in all probability the furnace of the Franklin Iron Works, in Oneida County, N. Y., will never be operated again. The company's store will soon be closed. Many of the furnace employees have moved away, and before long the village of Franklin Iron Works, whose inhabitants depend solely upon the furnace for a livelihood, will be deserted.

The Colorado Fuel & Iron Company's new plant at Denver, Colo., will be a very large and complete one. E. C. Potter of Chicago is the engineer in charge of the planning of the same, and he is securing only the latest and most approved machinery. In the foundry it was his intention at first to use only electric cranes, but having seen the Steam Hydraulic in use in the foundry of Fraser & Chalmers, at Chicago, decided to use the Ridgway Crane.

The Bellaire Nail Works, of Bellaire, Ohio, are changing over the old nail-plate mill at this plant to roll steel skelp. The mill adjoins the blooming mill, and the red hot billets will be handled directly from the shears into the furnaces. The mill will be equipped with the best appliances for handling the product quickly and all the cranes will be Ridgway Steam Hydraulics. As the finished skelp leaves the shears a Ridgway Crane will take it and both weigh and load it.

The Harrisburg Rolling Mill Company are changing their large grooved skelp train to make 30 inch skelp. This will increase the output of this mill to 200 tons per day. This whole output will all be weighed and loaded by a single quick acting Ridgway Steam Hydraulic Crane.

The Norristown Steel Company of Norristown, Pa., have published an official circular, in which they announce that in consequence of financial embarrassment caused by a heavy strain on their resources for some time back in making important extensions to their works, and because of the present depreciation in the market, as well as their inability to collect promptly their outstanding accounts, the company have passed into the hands of receivers. The receivers appointed were N. H. Larzelere and H. H. Haines, who have entered the required security. The circular further states that the court took this action to avoid undue sacrifice of the company's assets, and to insure the most equitable and favorable distribution of the same, in the interests of all who are beneficially entitled. It states that the works are well equipped, and in the best condition, and will be continued in operation right along. All orders now on hand, as well also as those now coming in daily, will be attended to with promptness and care, and it is expected that the affairs of the company will quite soon be

brought back again to a strong financial condition.

The blast furnace of the North Carolina Steel & Iron Company, at Greensboro, N. C., recently completed, has never been operated owing to lack of capital. The stack is 70 x 14 feet, equipped with two Ford and Moncur stoves. Valuable mineral property is said to be owned by the company.

Valentine Furnace, at Bellefonte, Pa., which blew out for re-lining and repairs on February 12, has completed alterations and resumed operations March 29.

Chester Furnace at Thurlow, Pa., blew in March 27. The former blast ended in September last.

At a meeting of the stockholders of the Pittsburgh Metallurgy Company held in the Times Building, Pittsburgh, last week, the following directors were elected: J. W. Friend, J. H. Gloninger, Jno. A. Elliott, M. A. Green and M. V. Smith. This concern have decided to change their title, and during this month application will be made for a charter for an intended corporation to be known as the Fuel Gas Engineering Company, which will succeed to the business and interests of the Pittsburgh Metallurgy Company.

We have already referred to the fact that the Tyler Tube & Pipe Company, Washington, Pa., had decided to double the present capacity of their plant. With this object in view, the concern have closed a contract with the Indiana Bridge Company for the erection of a new building of 80 feet span, to be constructed entirely of iron and finished within 60 days. The contract for a large regenerating welding furnace, and for another bending furnace has been let to the S. R. Smythe Company, Incorporated, engineers and contractors of Pittsburgh. The welding furnace will be 28 feet long, and will be equipped with the latest improved machinery. The Babcock & Wilcox Boiler Company have been awarded a contract for an additional 250 horse-power boiler plant. Work on these additions and improvements will be commenced at once and pushed rapidly to completion. The Tyler Tube & Pipe Company was originally located in Boston, Mass., but about three years ago was removed to Washington, Pa., and the company was reorganized with a capital stock of $200,000, $50,000 of which was subscribed by citizens of Washington, Pa. The concerns are manufacturers of charcoal iron and special steel boiler tubes and charcoal iron blooms.

Work of remodeling the old Malleable Iron Works at Youngstown, Ohio, will be commenced shortly, preparatory to the starting of a tin plant by a company known as the Youngstown Tin Plate Company. The machinery for the plant has all been bought, and is now ready for shipment. The proprietors expect to put the plant in operation in about a month. Two Morewood machines will be placed in position and worked night and day; they will have a capacity of 35 boxes of bright tin and eight boxes of terne plate every 24 hours. The men who have interested themselves in this enterprise have worked in tin mills on both sides of the Atlantic. The officers are: Samuel Thomas, president; David T. Edwards, secretary and treasurer; Joseph Chapman, superintendent. Mr. Chapman arrived in this city this week from Philadelphia, where for the past year he had charge of the extensive plant of Merchant & Co. A majority of the stockholders have been in the employ of the N. & G. Taylor Company, also of Philadelphia.

The new sheet and tin mill of the Falcon Company, at Niles, Ohio, is being hurried to completion. The machinery of one of the sheet mills is being run to "limber" it up, and the intention is to commence rolling iron full turn Monday. A large force of men is at work, but it is not expected to have the tin mill ready for operation in less than two months. The plant is said to represent an outlay of $500,000, and will give employment to 350 persons. It is so planned that if the tariff on tin plate is disturbed so that American manufacturere is made unprofitable, most of the plant can be operated as a sheet mill. It is equipped to roll the widest sheet of any mill in the country—55 to 60 inches across.

The Oliver & Roberts Wire Company, of Pittsburgh, made an excellent showing in March. During that month, the rod mill produced 5463 net tons of wire rods, the wire mill, 6444 net tons of wire and the nail factory 50,347 kegs of wire nails.

The managers of the New Castle Tin Mill of New Castle, Pa., have just ordered an improved automatic pickling machine. This machine is manufactured in England. The engines and other machinery for the new plant are arriving every day and the mechanics are placing them in position. The managers of the mill confidently assert that tin will be made in New Castle by June 1.

The best run of iron made by the Ohio Iron & Steel Company, Louisville, Ohio, since it was started, was turned out Thursday. For the 24 hours preceding Thursday morning 177⅗ tons of No. 1 iron was turned out.

The nail factory of the Mahoning Valley Iron Company, of Youngstown, Ohio, will resume work on Monday.

No. 2 Longdale Furnace, at Longdale, Va., was out of blast three weeks during March to make repairs. Both stacks are now in blast.

Machinery.

The Enterprise Boiler Company, Youngstown, Ohio, are furnishing the iron work for the four fire-brick stoves of the Massick and Crooke design, now being erected at the plant of the Rosena Furnace Company at New Castle, Pa., by McClure, Amsler & Co. of Pittsburgh. The Enterprise Boiler Company are running their works full time and have considerable work on hand.

The Danville Foundry & Machine Company of Danville, Ill., have been so pushed with orders that they have found it necessary to enlarge their foundry. The buildings, which are low, will be raised and the foundry will be equipped with Ridgway Steam Hydraulic Cranes, orders for which have been placed.

The McShane Bell Foundry Company of Baltimore will soon break ground for a new plant in Linden Township, near Rahway, N. J.

Charles Duisdieker will erect a foundry and machine shop at Pekin, Ill.

The Gillette-Herzog Company of Minneapolis, Minn., have decided to erect a foundry building as a part of their plant. The cost will be $25,000.

The Crane & Breed Mfg. Company of Cincinnati, Ohio, are enlarging the capacity of their large foundry. Among the new machinery contracted for is a 15-ton Bidgway Steam Hydraulic Crane.

Hemmingway Brothers, of Lynn, Mass., have leased a building at Johnstown, N. Y., and will soon open a machine shop at that place.

J. Sliptoe & Co., 177, 179 and 181 East Pearl street, Cincinnati, Ohio, have again been compelled to move in order to secure greater and more acceptable quarters for the production of their specialty, crank and geared shapers. This they have succeeded in doing by securing the premises at 57, 59 and 61 Elm street of the same city, and which they have fitted up with the most modern tools and machines necessary.

The compress polishing wheel has passed into the hands of new owners, who have organized the Compress Wheel Company and are manufacturing it at 149 and 151 Huron street, Chicago. C. H. Wilmerding is president, F. Cramer is vice-president and treasurer and E. W. Cramer is secretary.

The Wells Machine Works of Fostoria, Ohio, needing more room and capital for the manufacture of their pipe threading machines, consolidated with the Merrill Mfg. Company of Toledo, Ohio, and moved their plant to the spacious shops of the latter company. The Merrill Mfg. Company are putting in extensive new machinery, have doubled their force and are now working day and night in their efforts to fill their orders. Mr. Wells has personal supervision of their manufacturing department. The first hand-pipe threading machine manufactured by Mr. Wells was patented in 1887, the title to which is now in litigation in the United States Court of Appeals. This machine, however, has not been offered on the market for over a year, it being supplanted by later productions. Two large-sized machines will be added to their line early in April.

The Totten & Hogg Iron & Steel Foundry Company, closed a contract last week with the Wright Shovel Company of Anderson, Ind., for a complete sheet train.

The machine shops of the Penokee and Gogebic Consolidated Mines at Ironwood, Mich., have been burned. Valuable patterns of mine equipment and machinery were destroyed. The loss is $14,000.

The Builders Iron Foundry of Providence, R. I., have shipped to Chicago a 36-inch venturi meter manufactured under the patents of Clemens Herchel, C. E., New York city. This meter will be placed in the extreme southeast corner of the grounds and will measure the entire water supply of the Columbian Exposition (about 24,000,000 gallons a day). The recording apparatus will be exhibited in the adjacent building of the Sewage Cleansing Works.

The Ball Engine Company, Erie, Pa., manufacturers of automatic cut-off engines, have recently built a cross-compound condensing heavy duty engine, which will be on exhibition at the World's Fair. The engine has an 18-inch high-pressure cylinder, 36-inch low-pressure cylinder, 18-inch stroke, 225 revolutions and is rated at 500 horse-power. It will furnish power for 2 Edison 175 kilowatts generators, which are to furnish current for one of the two electric fountains. This engine will be placed in the main-power plant, which will contain 43 engines, built by prominent manufacturers all over the country. The engine will be painted pure white with the lettering of gold, in the same manner as all the other engines in the main power plant at the exhibition. The engine is a very handsome one and will no doubt attract considerable attention.

The Morrison Foundry and Machine Works of Youngstown, Ohio, are very busy at present, having all they can do in light iron castings. The outlook is that the thriving concern will have a steady run throughout the summer.

The Youngstown Brass Works of Youngstown, Ohio, are running full, and this week have been working upon a large order for brasses from the Cleveland Rolling Mill.

Notices have been posted in the shops of the Westinghouse Air Brake Company, at Wilmerding, Pa., notifying certain employees of a reduction in wages varying from 10 to 50 per cent.

Wm. Tod & Co., Youngstown, Ohio, have received an order from the Durango Steel & Iron Company of Durango, Mexico, with offices at Des Moines, Iowa, for a blowing engine. The size of the engine is 38 x 48 inch steam cylinder and 84 x 48-inch air cylinder. The same firm have recently received an order for a Porter-Hamilton engine 18 x 24 inches in size, to be furnished to the Homestead Works.

The Minnesota Iron Company of St. Paul have placed an order with the Lake Shore Iron Works of Marquette, Mich., for 2 ore crushers which will weigh 65 tons each, and will have an opening 30 x 30 inches.

Miscellaneous.

The Natural Gas Company of West Virginia have declared a quarterly dividend of 1½ per cent., payable April 6.

It is stated that a movement is on foot to erect a plant at Latrobe, Pa., for the manufacture of fuel and illuminating gas. It is proposed to furnish gas by a process covered by patents granted to Melvin D. Compton.

The Standard Underground Cable Company of Pittsburgh have declared a quarterly dividend of 1½ per cent, payable on April 10.

The new plant being erected at Chillicothe by Sears & Nichols is nearing completion, and when finished will be one of the best appointed in the West. The best labor-saving machinery only is being put in. The cranes will be the Ridgway steam hydraulic, the order for which has been placed with the Messrs. Ridgway.

The Pittsburgh & Lake Erie Railroad Company have commenced the erection of new repair shops at Riverton station, McKeesport, Pa.

The lower floor of the Lawton Building on Prince street, Kingston, N. Y., is being prepared as rapidly as possible for the occupancy of the United Columbian Electric Company, electrical apparatus manufacturers, who are anxious to begin work at as early a date as possible. A 45 horse-power engine, built by Skinner & Arnold of Albany, N. Y., is being put in and workmen are placing the shafting.

The Gowanda Agricultural Works, of Gowanda, N. Y., have decided to remove the plant to Tonawanda, N. Y.

Among recently authorized corporations in Illinois are the following: The American Car & Railway Construction Company, at Chicago; capital stock, $1,200,000; for the manufacture of motors and locomotive engines, rolling stock appliances, and supplies for railways; incorporators, Watson Franter, William A. Conover and J. G. Wolfe. The Robinett Hydraulic Motor Company, at Chicago; capital stock, $100,000; for the manufacture of hydraulic motors; incorporators, W. H. Robinett, C. W. Selfridge and George A. Masters. Triumph Boiler Cleaner Company, at Chicago; capital stock, $30,000; for the manufacture of machinery; incorporators, Olin H. Johnson, George G. Williams and Fred S. Benjamin. The Champion Self-Heating Sad-Iron Company, at Chicago; capital stock, $25,000; manufacture and sell sad irons; incorporators, Theodore Steuger, Thomas F. Powers and Harry F. Farnsworth. The Automatic Furnace Company, Chicago; capital stock, $50,000; incorporators, Charles F. Haines, C. S. Wallis and Charles M. Weaver. The American Smoke Preventer Company, Chicago; capital stock, $100,000; incorporators, William R. Mills, Charles Smith and Charles A. Pratt. American Steam Boiler Compound Company, Chicago; capital stock, $100,000; incorporators, William E. Deuer, William I. Cronin, Charles P. E. Dumas, Charles E. Coogan and James Young.

TRADE REPORT.

From all accounts, the Ore situation in Cleveland has not materially changed. The largest interests have not yet covered, and the general fact remains true that the position of the Ore mines is stronger than it was expected to be earlier in the season. The demand for Bessemer Ore promises to be heavy, and it looks as though it would tax the supply with the heavy tonnage of Soft Steel called for by the rolling mills. Had this been a year of large sales of Rails there would unquestionably have been something approaching a famine.

The conviction is gaining ground that an effort on the part of large Ore buyers is being made to counteract the effect of the rise in Bessemer Pig on the attitude of Ore sellers, by putting pressure on the market for the metal. It is hinted that repairs of works have been undertaken earlier than there was any urgent necessity for, so as to restrict consumption and put on the market supplies already contracted for.

It is certain that Bessemer Pig is easier in the Pittsburgh market, although the reservation is made that when the partly artificial pressure is removed values may quickly recover.

The circumstances which appear to militate against Bessemer Pig are aiding Soft Steel Billets. Buyers are turning Eastward, however, in order to avoid the Pittsburgh market. Thus negotiations are said to be under way at tidewater for the Chicago district, and an Eastern Pennsylvania mill usually buying in the West is also inquiring in the Eastern markets. Some signs of weakness are appearing in the territory lying between Chicago and Pittsburgh, where a new comer has been taking business usually controlled by rival mills.

While the temporary halt seems to be favoring buyers, it is stated as an argument on the other side that the requirements for April and May Soft Steel are not yet fully covered.

In Foundry Irons there has been little change lately. Our Cincinnati correspondent notes a sale of No 2, on the basis of $8 75, for delivery during the balance of the year, and in other quarters facts appear to show that Southern producers, both in Alabama and in Virginia, keep crowding the market.

There has been very little change along the whole line of Manufactured Iron and Steel. Philadelphia records a little better feeling in Bars and Skelp, and Pittsburgh notes an attempt to get better prices for Soft Steel Bars. Plates still show evidences of distress, and Sheets in Philadelphia are selling at very low prices.

Reports are conflicting concerning the state of the Structural market. In some quarters spring contracts are lingering. An interesting item is the approaching letting of a contract for 17,000 tons for the Park avenue elevated improvement in New York, which is looked upon as being likely to fill some hungry mills at least for a time.

Tin seems to be becoming a more and more unmanageable load for the boomers who have discounted the coming duty on that metal. Copper is dragging along quietly. Lead has stiffened after good purchases by large consumers. There is only moderate activity in Tin Plates.

Philadelphia.

Office of *The Iron Age*, 230 South Fourth St., PHILADELPHIA, Pa., April 4, 1893.

The commencement of the fourth month in the year does not bring with it any new or encouraging features. The volume of business is large, and prices are steady, but they are so low that manufacturers insist that they are working on so small a margin that it precludes the idea of doing more than getting out whole. Further weakness, therefore, is something they dread to meet, and yet it is not entirely certain that this can be avoided. As already stated, there is no reason to complain of business being dull; the point is, that it is unprofitable, and it is not clear how it can be made otherwise, unless there is some very decided change in the conditions, of which there is no immediate probability. Supply and demand are very evenly balanced; the weak point is, that the facilities for production are growing all the time, so that, heavy as the demand is, and heavy as it may be, the impression prevails that it can be easily met, hence there is no inducement for speculative buying. Many large producers are also of opinion that there is no good reason for refusing any business that can be had at about the figures now ruling, which appears to be confirmed by the ease with which orders are placed for material of almost any description. Apart from the matter of prices there is no room for complaint, and it may be that even in that respect the situation is not as bad as it is made out to be. This article simply aims to voice what the trade have to say, which, in regard to prices, is singularly in accord.

Pig Iron.—The demand is much of the same character as noted for several weeks past, fairly active for standard brands, a little slow for other descriptions. There is no particular pressure to realize, however, so that in ordinary cases sales are at unchanged prices. At a reduction of a few cents per ton, sales could easily be increased, while a few cents advance just as effectually checks the demand, so that the market may be said to be about on an even keel. Consumption is nearly up to its maximum, and while there may be some further increase during the next 60 days, the chances are equally strong that the supply will keep pace, particularly if there is any stiffening in prices. Taking everything into consideration, therefore, there does not appear to be much chance for higher prices, while at the figures now ruling it seems equally improbable that there can be any appreciable decline, and, as a matter of fact, the trade are so much in accord on this point that it is impossible to get up anything like a scare. Buyers feel that they can get all the Iron they are likely to need at current prices, while sellers are equally sure that concessions are uncalled for, unless for an off grade, for spot cash or for some reason peculiar to that particular transaction. For the present, therefore, sales are about on a par with the supply, and prices are steadily held as follows for Philadelphia and equivalent deliveries, with 25¢ @ 50¢ less on Southern brands at Harrisburg and intermediately to Baltimore:

American Scotch, No. 1X	$16.00	@	$16 50
American Scotch, No. 2X	15 00	@	15.50
Standard Penna. (Lake Ore), No. 1x	14.75	@	15.00
Standard Penna. (Lake Ore), No. 2x	14.00	@	14.25
Standard Virginia, No. 1x	14.50	@	14.75
Standard Virginia, No. 2x	13.75	@	14.00
Virginia and Southern, No. 1x, Soft	14.00	@	14.50
Virginia and Southern, No. 2x, Soft	13.25	@	13.50
Standard Penna. and Virginia Forge	13.00	@	13.25
Ordinary Forge	12.50	@	12.75

Freights.

Alabama Furnaces, Rail to Philadelphia	$4.31	@	.....
Alabama Furnaces, Rail and Water to Philadelphia	4.01	@	....
Alabama Furnaces, Rail to Baltimore and Harrisburg	4.06	@	....
Virginia Furnaces, Rail to Philadelphia	2.25	@	$2.75
Virginia Furnaces, Rail to Harrisburg	1.50	@	2.00
Virginia Furnaces, Rail to Baltimore	1.75	@	2.25

Steel Stock.—There is a trifle better demand for Cornwall Bessemer, as well as for Standard Bessemer, but there is no change in prices, which are about as follows: Bessemer, $15.25 @ $15.50, delivered; Standard Bessemer, $16 @ $16 25, and Low Phosphorus, $17.50 @ $17.75.

Steel Billets.—The market is not as firm as might be supposed from some of the reports that are floating around. Mills in Pittsburgh and Wheeling claim to be full up to midsummer, but it is noticed that bids of $25 @ $25.25 for any of the intervening months are not long waiting for acceptance. Of course it is too soon to predict that the flurry is over, but in the meanwhile consumers are not in any hurry to place orders at to day's figures, but from the way quotations are given it looks as though makers are disposed to sell liberally at prices around $25, for Schuylkill Valley or equivalent points. Consumption is very large, however, and from present appearances mills will have all the business they can handle for some time to come, although for late deliveries prices are inclined to weaken.

Steel Rails.—Business is not specially active at present, although there is so much special work of various kinds that mills are not suffering for want of Rail orders. Prices are unchanged at $29, f.o.b. cars mills, and for Street Rails, which are in good demand, $32 @ $36 is quoted.

Muck Bars.—Market extremely dull, with somewhat liberal offerings at $22.50 @ $22.75, f.o.b. cars sellers' mills. There is little or no inquiry, and bids for round lots are hard to find.

Bars.—Manufacturers report a better demand with some slight indications of better prices. Mills are getting to be well supplied with orders, and the average of sales for the week would probably show 50¢ ℔ ton advance. Sellers are quoting a little higher yet, but the advance so far has been of a negative character, viz., in the refusal of such concessions as were granted in recent transactions. On top of this, manufacturers ask 2½¢ per 100 lb additional, but they are not getting it except in isolated cases, but it shows the temper of the market. General asking prices are 1.65¢ @ 1.70¢ for best refined Bars, city delivery, or 1.55¢ @ 1.60¢ at interior points. Steel Bars, 1.60¢ @ 1.90¢, according to quality.

Skelp.—The demand is improving, and manufacturers are talking decidedly better prices, although as yet 2½¢ ℔ 100 lb is all the advance that can be claimed, and then on small lots only. Mills are fairly busy, however, and for the present 1 55¢, delivered, is the usual asking figure.

Plates.—Steady to firm is the usual report from this department. A great deal of business is on hand, and while deliveries in some cases extend a long way ahead, there is plenty of work from the current demand, and prospects are believed to warrant somewhat better prices. As a rule, sales average probably $1 ℔ ton higher than during last month, but this barely offsets the higher cost of stock, so that manufacturers are feeling around for still another dollar per ton on new business. Competition is sharp, but the feeling is strong, and with the continuance of demand such as during the past two weeks, it is not unlikely that sellers will

gain their point. Meanwhile general asking prices, delivered, are about as follows:

	Iron.	Steel.
Tank Plates	1.80 @ 1.85¢	1.80 @ 1.85¢
Shell	2.10 @ 2.20¢	2.10 @ 2.20¢
Flange	2.70 @ 2.90¢	2.25 @ 2.40¢
Fire Box	3.00 @ 4.00¢	2.50 @ 2.70¢
Special qualities	3.25 @ 3.75¢	

Structural Material.—There is nothing special going on at present, except a few contracts for Architectural work, which are eagerly competed for at low prices. Mills are well employed, however, and prospects are considered to be encouraging as regards the amount of work, but not particularly so as regards prices, which remain at the lowest point quoted for several weeks past, viz.: Beams, Channels or Tees, 2¢ @ 2.20¢, according to size of order; Angles, 1.80¢ @ 1.85¢; Universal Plates, 1.80¢ @ 1.90¢.

Sheets.—There is a decided improvement in the demand, and orders have accumulated quite largely during the past week or two. Prices are very irregular, and on common qualities are extremely low, but best makes are quoted about as follows for small lots:

Best Refined, Nos. 14 to 20	2.75¢ @ 2.85¢
Best Refined, Nos. 21 to 24	2.90¢ @ 3.00¢
Best Refined, Nos. 25 to 26	3.15¢ @ 3.30¢
Best Refined, No. 27	3.30¢ @ 3.40¢
Best Refined, No. 28	3.40¢ @ 3.50¢

Common, ¼¢ less than the above.

Quotations given as follows are for the best Open-Hearth Steel, ordinary Bessemer being about ½¢ lower than here named:

Best Soft Steel, Nos. 14 to 16	2½¢ @ 2⅝¢
Best Soft Steel, Nos. 18 to 20	2⅝¢ @ 3¢
Best Soft Steel, Nos. 21 to 24	3⅛¢ @ 3¼¢
Best Soft Steel, Nos. 25 to 26	3⅜¢ @ 3½¢
Best Soft Steel, Nos. 27 to 28	3⅜¢ @ 3½¢

Best Bloom Sheets, ¼¢ extra over the above prices.

Best Bloom, Galvanized, discount..70 and 5 % @ 70 and 10 %

Old Material.—Dull and irregulars, Nos 1 and 2 Wrought Scrap being weak and lower, while Turnings and Borings and good Steel Scrap are in demand at the full prices of last week, viz.: Old Iron Rails, $18 @ $18.50, delivered; Old Street Rails, $19 @ $19.50; Old Steel Rails, $15 @ $16; No. 1 Railroad Scrap, $15 @ $16, Philadelphia, or for deliveries at mills in the interior, $16 @ $16.50, according to distance and quality; $8 @ $9 for clean new No. 2 Light Scrap; $7.50 for old No. 2 Light Scrap; $11.50 @ $12 for Machinery Scrap; $12 @ $12.25 for Wrought Turnings; $8 for Cast Borings, and nominally $22 for Old Fish Plates, and $13 @ $14 for Old Car Wheels.

Wrought-Iron Pipe.—There is nothing favorable to report in this line, prices being weak and in some cases almost on the point of demoralization. Discounts cannot be quoted with any exactness, as all depends on the kind of order that may be presented.

Cincinnati.

(By Telegraph.)

Office of *The Iron Age*, Fifth and Main Sts., CINCINNATI, April 5, 1893.

There is a fair volume of business passing in Pig Iron, but there have been no extended purchases made during the week. Buyers are urgent for prompt delivery of current purchases and for all Iron due on previous contracts, but the tone of the market has not improved and prices are as low as ever—in fact, we hear of one sale of No. 2 Foundry made direct by the furnace to consumer as low as $8.75, f.o.b., Birmingham, and for delivery running through this year. This, of course, is an exceptional transaction on which no commission was paid, but there is no doubt that sales have been made at $9, f.o.b., Birmingham, although 25¢ more is generally obtained. While there is liberal melting of Iron by the foundries in nearly all lines of business, yet there is such an abundance of Southern Iron for sale that buyers do not seem disposed to anticipate their wants more than is absolutely necessary. Only the larger and strong Iron companies contend firmly for full prices, and other producers are so numerous as to make it easy to buy at the low rates current. Many hope that stocks will show such a material reduction during the month of March as to favorably affect the trade, but this hope is by no means confident and there are few, if any, furnaces which would not take orders to a liberal extent for immediate or short forward delivery at the current prices. A considerable part of the business here is for Eastern destination, and yet the quantity of Pig Iron passing into consumption in this district is of liberal proportions. Quotations are as follows:

Foundry.	
Southern Coke, No. 1	$13.25 @ $13.50
Southern Coke, No. 2	11.75 @ 12.00
Southern Coke, No. 3	11.00 @ 11.25
Ohio Soft Stone Coal, No. 1	16.00 @ 16.25
Ohio Soft Stone Coal, No. 2	15.00 @ 15.25
Mahoning and Shenango Valley	14.75 @ 15.00
Hanging Rock Charcoal, No. 1	19.00 @ 19.25
Hanging Rock Charcoal, No. 2	18.00 @ 18.50
Tennessee and Alabama Charcoal, No. 1	15.50 @ 15.75
Tennessee and Alabama Charcoal, No. 2	14.50 @ 14.75
Forge.	
Gray Forge	10.75 @ 11.00
Mottled Neutral Coke	10.50 @ 10.75
Car Wheel and Malleable Irons.	
Standard Southern Car Wheel	18.00 @ 19.00
Lake Superior Car Wheel and Malleable	17.75 @ 18.00

Chicago.

(By Telegraph.)

Office of *The Iron Age*, 59 Dearborn street, CHICAGO, April 5, 1893.

The prospective early opening of navigation is influencing prices here on articles which can be shipped from Eastern lake ports at lower than all rail rates. The volume of business handled in this way is increased every year with the better services offered by the growing fleet of steam carriers to Lake Michigan ports, as well as to points reached through towns at the head of Lake Superior.

Pig Iron.—The situation is practically the same as that reported last week. A fair amount of trade has been done in local Coke Iron, the inquiry still being good from a considerable number of consumers. Prices on this class of Iron are quite firm, and transactions are notably increasing at slightly advanced rates. March deliveries from the furnaces here were unusually heavy, running easily 25 % above those of the corresponding month last year. Southern Iron has been rather quiet. Hardly anything has been done to establish prices, but from offers which have been made the condition of the Southern furnaces does not seem to have improved, although the leading companies refuse to meet extremely low prices current within the past two weeks. The Lake Superior Charcoal producers are feeling rather sanguine over their prospects. A better demand is reported in other markets, and not a few furnace companies have already sold their entire product for several months. A good inquiry is reported here, but consumers are not disposed to pay full prices. Offers are made of 25¢ @ 50¢ below quotations, which sellers are refusing to accept. Quotations are as follows, cash, f.o.b. Chicago:

Lake Superior Charcoal	$16.50 @ $17.00
Local Coke Foundry, No. 1	13.75 @ 14.25
Local Coke Foundry, No. 2	13.00 @ 13.25
Local Coke Foundry, No. 3	12.75 @ 13.00
Local Scotch	14.00 @ 15.00
Ohio Strong Softeners	16.00 @ 16.50
Southern Silvery, No. 1	@ 15.00
Southern Silvery, No. 2	@ 14.50
Southern Coke, No. 2	13.00 @ 13.35
Southern Coke, No. 3	12.60 @ 12.75
Southern, No. 1, Soft	13 00 @ 13.35
Southern, No. 2, Soft	12.60 @ 12.75
Southern Gray Forge	12.25 @ 12.35
Tennessee Charcoal, No. 1	16.50 @ 17.50
Alabama Car Wheel	@ 18.85
Coke Bessemer	14.50 @ 15.00
Hocking Valley, No. 1	16.75 @ 17.00
Jackson County Silvery	16.75 @ 17.00

Bars.—A continued good business is in progress and some indications have appeared of a little more firmness in values. Good orders have been placed by sharp buyers at 1.57½¢, Chicago, which would indicate that standard mills are maintaining prices for prompt delivery. The wagon builders are still purchasing a great deal of material, but they have been able to secure quite low prices, probably on account of the early opening of lake navigation, when they will receive their shipments by water. The agricultural implement manufacturers are now making their expected appearance. A large contract of this character will be closed some time this week. Prices for immediate delivery are quoted at 1.55¢ @ 1.57½¢, Chicago, half extras, for reasonably early delivery; but these rates are shaded considerably on contracts running into the future. There is a disposition among the mills, however, not to sell beyond July, on account of the possible labor troubles at that time. The experience of last summer is vividly remembered, and strike talk is having more effect than it had last spring. A strong tone is apparent in Soft Steel and quotations are somewhat firmer. While some mills are still selling at 1.65¢, Chicago, others are standing firmly at 1.70¢. Prices from store are quoted at 1.70¢ @ 1.80¢ on Iron and 1.75¢ @ 1.85¢ on Soft Steel.

Structural Material.—The demand for Beams and other building shapes is increasing with the very favorable building weather. Small lots constitute the bulk of the business, no large contracts having been placed the past week so far as can be learned. Buyers are not so much disposed to shop around for low prices as they were last month, although no real advance in quotations has been made. We continue to quote on mill orders, Chicago, as follows: Beams, 1.95¢ @ 2.05¢; Angles, 1.85¢ @ 1.95¢; Universal Plates, 1.90¢ @ 1.95¢.

Plates.—The boilermakers are again agitating for shorter hours, and the prospects seem to indicate a contest over this question, which may close up the shops for a time, as was the case last spring. The demand for Plates has been reasonably fair of late, but manufacturers' agents generally are complaining of the smallness of orders for mill shipment. Dealers are handling the great bulk of the trade, as the lots called for can easily and more promptly be furnished by them. Quotations on mill shipment, Chicago delivery, are as follows, for carload lots: Tank Steel, 1.85¢ @ 1.95¢; Shell Steel, 2.10¢ @ 2.15¢; Flange Steel, 2.25¢ @ 2.30¢; Ordinary Fire Box, 3.50¢. Store prices continue as follows: Nos. 10 to 14 Iron or Steel Sheets, 2.35¢ @ 2.60¢; Tank Steel, 2.20¢ @ 2.40¢; Shell, 2 40¢ @ 2.60¢; Flange Steel, 2.70¢ @ 2.90¢. Boiler Tubes are quoted nominally at 70 %, but concessions are made from this price according to the specification.

Sheets.—The heavy buying of Black Sheets is about over for the present and inquiries are light. Manufacturers' prices have slightly settled as the result of the competition for recent business and carload lots for shipment from mill are now 2.80¢ @ 2.85¢, Chicago, for No. 27 Common. Galvanized Iron has been in much better demand with the more favorable building weather, and prices are slightly firmer, extreme discounts having been withdrawn. The usual rate for mill shipment is 70 and 10 % discount on Juniata,

while small lots are selling at 70 and 5 % from stock. Sheet Copper is unchanged at 30 % discount in small lots from stock, but a little weakness is again apparent in large lots.

Merchant Steel.—Tool Steel has been especially active of late, the trade running mainly to high grades with less attention paid to difference in price. Cheap Steels are in fair demand, but large contracts are being held back until later in the season. Quotations are continued at 2¢ @ 2.20¢, Chicago, for mill shipments of Open-Hearth Machinery and Spring Steel; Bessemer Tire, 1.67½¢ @ 1.70¢, with Bar Iron extras; Tool Steel, 6¢ @ 7¢ for ordinary and 12¢ and upward for specials.

Rails and Track Supplies.—A better inquiry is noted by Rail manufacturers and considerable business was placed the past week in good-sized lots. A noticeable feature is the excellent demand for light Rails, especially for Mine Rails. The demand for this class of material recently has run to comparatively large lots, inquiries being for 100-ton lots instead of carloads. The report current that an additional 15,000 tons of Steel Rails had been placed with the Pueblo Mill by the Chicago, Burlington & Quincy Railroad is denied here. Prices are firm at $30 @ $32, Chicago, according to quantity. Iron and Steel Splice Bars are selling at 1.65¢ @ 1.70¢; Track Bolts with Hexagon Nuts, 2.60¢ @ 2.65¢; Spikes, 2¢ @ 2.10¢.

Old Rails and Car Wheels.—Business has been quiet in these specialties. Old Iron Rails are still nominally quoted at $18; Old Steel Rails at $11.25 @ $15, according to length, and Old Car Wheels at $14.50 @ $14.75.

Scrap.—The demand is somewhat better for nearly all classes of Scrap and more material is moving to outside consuming points. Prices, however, have not improved and quotations are unchanged. Dealers continue to quote as follows per net ton: No. 1 Forge, $15; No. 1 Mill, $10.50; Sheet Iron, $6; Pipes and Flues, $10; Axles, $21; Horseshoes, $15.50; Fish Plates, $16.50. Spikes and Bolts, $14.50; Cast Borings, $5.50; Wrought Turnings, $8; Axle Turnings, $9.50; Heavy Cast, $11.50; Stove Plate, $8.50 @ $9; Malleable Cast, $9; Mixed Steel, $10 @ $10.50, gross ton; Leaf Steel, $17.75.

Metals.—Copper is unchanged at 12½¢ for carload lots of Lake and 11½¢ for Casting brands. Spelter is somewhat stronger and may be quoted at 4.10¢ here, sales having been made at a slight advance over last week's quotations. In Pig Lead the week has been dull, with practically no change in values. Local consumers bought rather freely at 3.70¢ @ 3¾¢, but hesitate to pay advanced prices. The market closes very steady at 3.80¢, freely bid. Lead is offered in a limited way at 3.85¢, but sellers are generally asking 3.90¢.

Louisville.

LOUISVILLE, April 3, 1893

The market has been quiet with but little buying, prices remaining the same. Both for early and late delivery Gray Forge Iron at $8, Birmingham, can be obtained. There is an abundance of work among car companies and rolling mills, and pipe companies are running fuller than for some time. Charcoal Irons are in light demand. Old Wheels can be obtained, basis $13.25, Louisville. The largest sales during the week have been of Gray Forge and Mottled. We quote for cash f.o.b. cars, Louisville:

Southern Coke, No. 1 Foundry	$13.00 @ $13.25
Southern Coke, No. 2 Foundry	12.00 @ 12.25
Southern Coke, No. 3 Foundry	11.00 @ 11.25
Southern Coke, Gray Forge	10.75 @ 11.00
Spathite	11.50 @ 12.50
Southern Charcoal, No. 1 Foundry	15.00 @ 16.00
Southern Car Wheel	17.50 @ 17.75

Strong inducements have been offered to the Birmingham Rolling Mill Company to come here, and as the owners of the company largely reside here, it is reported that they meet with considerable favor.

St. Louis.

(By Telegraph.)

Office of *The Iron Age*,
Bank of Commerce Building,
ST. LOUIS, April 5, 1893.

Pig Iron.—The local demand for Pig Iron is very quiet, consumers apparently having full supplies on hand. No. 2 Foundry seems to be even weaker than last reported, and sales are reported on the basis of less than $9, f.o.b. cars, Birmingham. Gray Forge seems to be satisfied with reaching $8 as low-water mark, and at that price some fairly good sales have been made. We have heard of less than $8 being quoted for Gray Forge, but the difference amounted to only a few cents, and $8 is practically the market. No. 1 and No. 2 Soft Irons are in good demand, and the prices for these grades are a trifle firmer than the balance of the market. There is some talk of blowing out by one or two Southern furnaces, but at this writing there is nothing definite in this direction. Production continues unchanged, and while the demand does not show any great improvement, the outlook for an increased consumption is considered encouraging. We quote as follows for cash, f.o.b. cars St. Louis:

Southern Coke, No. 1 Foundry	$13.50 @ $14.00
Southern Coke, No. 2 Foundry	12.25 @ 12.50
Southern Coke, No. 3 Foundry	11.75 @ 12.00
Southern Gray Forge	11.25 @ 11.50
Southern Car Wheel	18.00 @ 18.75
Lake Superior Car Wheel	17.00 @ 17.50
Ohio Softeners	16.25 @ 17.00
Missouri Charcoal, No. 1 Foundry	13.50 @ 14.00

Bar Iron.—The demand for Bar Iron continues to show improvement, although prices remain virtually unchanged. There appears to be a firmer tone to the market, however, and any increase in the demand will doubtless make itself felt in prices. We quote as follows: Lots from mill command 1.57½¢ @ 1.60¢, half extras, f.o.b. cars East St. Louis. Jobbers quote 1.75¢ for lots from store, which would be shaded on large orders.

Barb Wire.—The demand from all sections is remarkably heavy, and jobbers and manufacturers have all they can well attend to. Spring trade is opening up in excellent shape, and will doubtless prove very heavy. Prices do not appear as strong as the circumstances would warrant. An early improvement in this direction is expected, however, and dealers would do well to anticipate their wants, as all indications point to a heavy demand. We quote as follows: Painted to jobbers in carload quantities, $2.20; Galvanized, $2.60.

Wire Nails.—A heavy demand is reported by manufacturers, and jobbers are replenishing their broken stocks. The spring demand will doubtless be heavy, and prices are in a fair position to advance. At the moment we quote $1 70 rate in carload quantities to jobbers.

Pig Lead.—The improvement noted in this metal in our last report continues to be a feature of the market, and sales are made on the basis of 3.80¢ @ 3.82½c., 150 tons selling at the former price to-day, with bids of 3.82½¢ for additional lots. There is a decided scarcity of this metal, and if the London market would show some little strength a higher range of prices would be in order here The market closed to-day at 3.82½¢.

Spelter.—The steady production of Spelter prevents any possibility of advance in the near future. Sales are made for May delivery at 3.95¢ and producers seem satisfied with this price. The consolidation spoken of last week came to naught, as the fourteen concerns represented failed to agree on any plan whereby the market could be benefited.

Freight Rates.

Pig Iron.	Per ton.
Birmingham, Ala., to St. Louis	$3.25
Chattanooga, Tenn., to St. Louis	3.00
Sheffield, Ala. to St. Louis	2.80
Barb Wire and Wire Nails.	**Per cwt.**
Pittsburgh, Pa., to St. Louis	18½¢
Salem, Ohio, to St. Louis	16½¢
Cleveland, Ohio, to St. Louis	15¢
Anderson, Ind., to St. Louis	11¢

Cleveland.

CLEVELAND, OHIO, April 3, 1893

Sales of Non-Bessemer Ore, high in phosphorus, at $2.75 ℔ ton are reported to-day. These Ores are mixed with a better grade of Non-Bessemers, bringing $3 @ $3.35 ℔ ton, and a good grade of iron. Some Bessemers from the Tilden, formerly the Colby, and from the Aurora and Norrie Mines have been sold during the past week, but in scattering quantities. Up to the present writing the heavy buyers have not dipped into the market, and it is the consensus of opinion about the big Ore offices here that the aggregate sales of Ore, both Bessemer and Non-Bessemer, to date do not exceed 750,000 tons, and this is considered a very liberal estimate. If the boom for Bessemer Iron had continued the Ore market would now have been remarkably active. As it is the demand for good Bessemer Irons is not active, and in place of the $14.25 @ $14.35 quotations of two weeks ago to-day's prices are $14.10 @ $14.15. Some Bessemer Ores are being taken every day at about $3.90 @ $4.10 ℔ ton, f.o.b. cars Cleveland, Fairport and Ashtabula, but the buying is really very light as yet, and until freight rates are agreed upon it is not easy to determine when heavy buyers like the Illinois Steel Company and the Carnegies will enter the market. Rumors of vessel charters for transporting Ore have been made, but these really amount to little. The Ashland rate will very probably be $1.10 ℔ ton, and the rates from Marquette and Escanaba correspondingly reduced from early season estimates.

No one would be surprised if the heavy buying movement should begin at any time.

Iron Ore.—During the past week about 35,000 tons of Ore have gone forward to the furnaces, as compared with 28,000 tons for the corresponding week last year. The market is rather quiet owing to the fact that Bessemer Irons have not quite held their own.

Pig Iron.—Bessemer Irons have weakened slightly and are quoted to-day at $14.10 @ $14.15. The interruption incidental to an unusually exciting local election has temporarily diverted attention from the Iron interests, but this is likely to be renewed to morrow. Not a very large amount of Ore has changed hands during the past week. Gray Forge Iron is quite firm at $12.40 @ $12.50. Buyers are not making very liberal demands this week and say that they are fairly well supplied for the month of April.

Scrap.—The market continues dull, with the following quotations in force: No. 1 Railroad Wrought, $15 ℔ ton; Cast Scrap, $11 ℔ ton; Wrought Turnings, $10 ℔ ton; Cast Borings, $7 ℔ ton.

Old Rails.—A sale of Old Americans at $19.50 is reported, but the demand is rather weak. The supply large.

Muck Bar.—The market is still weak. Muck Bars are not firm, even at $24 25 ℔ ton, Cleveland.

Old Wheels.—One or two scattering sales are reported at $14 @ $14.25.

Barb Wire.—The demand has been higher during the past week, and prices are firmer. An exceptionally good spring trade is anticipated.

Freights.—Railroad and furnace men are endeavoring to arrange on a new schedule of rates from Lake Erie ports to the furnaces. The new tariff will likely be promulgated in a day or two. A slight reduction from last season's figures is expected.

(By Telegraph.)

Some non-Bessemer ores just outside of the Bessemer limit are selling at $3 50 ℔ ton. These are intended for mixture with non-Bessemer Ores that are low in Iron, and that can be bought this season as low as $2.75 ℔ ton, f.o.b. Cleveland. Some Bessemer Ores are selling at $3.90 ℔ ton, but the real active buying movement has not begun.

Boston.

Office of *The Iron Age*, 146 Franklin St., }
BOSTON, April 4, 1893. }

Generally there is only a quiet trade to note in the Iron and Steel markets here, but there is a good volume of business going on as compared with other seasons. Manufacturers and machinists are unusually busy, but the offerings of stock in the shape of Iron and Steel are so free that these manufacturers dictate their own terms to a greater extent than is usually the case. The production of Pig Iron is enormous, and the producers are all anxious sellers, and though the foundry people are using more Iron than usual, yet they buy at nearer to their own terms than at almost any period in the history of the trade.

Pig Iron.—Trade in Pig Iron is quiet and the tendency is slightly in the buyers' favor. There is a better call for Virginia Iron than almost any other Iron sold here, and the dealers say that they could sell more of it if they could get it fast enough. The quotations on Southern Iron are at: No. 1, $15 @ $15.50; No. 2, $14 @ $15; No. 3, $13.50 @ $14. Virginia Iron is quotable at about $15.50 for No. 1. The above quotations on Southern Iron are for Iron on the dock in Boston. Pennsylvania Iron is in very quiet demand in this market, and it is admitted that prices are more in the favor of the buyer. The market for Iron at shipping port is quotable at: No 1, $15; No. 2, $14.50; Gray Forge, $13 @ $13.50. Western Irons are in fair demand, with the market at $17 @ $19 for Iron on dock at Boston, according to quality.

Bar Iron.—The strongest feature in the market on Bar Iron is the fact of the strong market on Steel Billets. The Worr mill at Wareham is being run to complete orders and run up the stock of Old Iron on hand. Bar Iron is quoted at: Ordinary Old Material Bars, from mill 1.60¢ @ 1.65¢; from store, 1.65¢ @ 1.70¢. Best Puddled Iron Bars are quoted at 1.85¢ @ 1.95¢ from mill; from store, 2.20¢ @ 2¼¢. Norway and Swedish Bars are quiet at $65 @ $67 ℔ ton for bars and shapes out of store.

Building Iron.—The market on Building Iron is more quiet. Only a few contracts have been placed the past week, and these at easier prices, slightly, it is complained. One contract of some 200 tons is mentioned for a building in Boston. There are other contracts hanging, but the contractors expect lower prices than manufacturers at Pittsburgh will authorize agents to accept. The market is nominally little changed in quotations at: Beams and Channels, 2 07½¢ @ 2.20¢ from mill; from store, 2¼¢ @ 2.30¢; Angles, 2¢ @ 2.10¢ from mill; from store, 2¼¢ @ 2¼¢; Tees, 2.40¢ @ 2¼¢ from mill; from store, 2¼¢ @ 2¼¢

Steel, Steel Plates and Steel Rails.—The market on Soft Steel is firm, from the fact that the firm position of Billets is sustained, following the very firm market on Bessemer Pig. Manufacturers notify agents here that they believe the strength in Bessemer Pig has come to stay. They also suggest care in the taking of orders for Steel. At present the market is quoted at: Bessemer Steel, 2 05¢ @ 2.20¢; Machinery, 2¢ @ 2.15¢; Tire and Sleigh Shoe, 2¢ @ 2 10¢; American Cast, 7¢ @ 7½¢; English Cast, 13¢ @ 15¢. American Steel Rails are yet quoted at $29 at mill, but buyers hold off. There is a deep-seated impression that Rails should be lower, with the feeling that it is the combination only that holds the market up. Hence any news suggesting disaster to the combination is eagerly sought for. Steel Plates seem to have sustained the stronger position mentioned last week, though trade is dull. The quotations are at: Tank, 1.95¢ @ 2¢; Shell, 2.05¢ @ 2.10¢; Flange, 2½¢ @ 2 35¢; Fire Box, 2 60¢ @ 3 30¢.

Nails.—The demand for Nails is pretty good, with the market steady. Cut Nails, both Iron and Steel, are steady at $1.50 for carload lots, and at $1 60 ℔ keg for smaller lots. Steel Wire Nails are steady, with the list of extras the same as on Cut Nails.

Pipe and Tubes.—The dealers in Pipe note a rather dull market, though there is something doing in the way of water contracts. There is a complaint of prices being cut, with the explanation from some of the best in the trade that there are too many manufacturers, and that they are constantly yielding in prices for the sake of a trade that can pay them only very little at the best. The Pipe card is nominally unchanged, however. Boiler Tubes are steady at 65 % off from the list on all sizes.

Scrap Iron.—There is generally a rather better request for Scrap, though the market is still far from being a real active one. No. 1 Wrought is quoted at 50¢ ℔ 100 to buy from the collectors and savers, but at 60¢ to sell good assortments delivered at the mill where used. Old Horseshoes and special sizes of No. 1 Wrought Scrap are quotable at 60¢, while special lots, delivered at the mill where wanted, would command as high as 65¢ @ 70¢, as to quality. Light Iron is dull at 30¢ @ 40¢ Machine Shop Scrap is quiet at 25¢ @ 30¢ for Cast and at 30¢ @ 35¢ for Wrought.

Metal Market.

Copper.—The conditions are practically the same as outlined in last week's review of the market. In any event, the turn from the first to the second quarter of the year has witnessed no change in the attitude of buyers, and even with seven or eight months' restriction upon production there is still more than enough Copper to go around. For that matter, the surplus is sufficient to have more or less depressing effect upon values, and has brought the market into a condition of feverishness, the end of which is extremely problematical. At present there are sellers of Lake Superior Ingot for prompt delivery at 11½¢, regular terms, and Exchange contracts running as far as August have been offered at the same price, without attracting buying orders. Cakes and Wire Bars for prompt delivery brought some premium over that price, but the demand for those is rather disappointing and orders for round lots could probably be placed at prices very close to current quotations for Ingot. Casting Copper is also easier. In fact, 10¾¢ has become a common selling price for round lots, while transactions involving only moderate quantities were effected at 10.70¢, if, indeed, not at a shade less.

The monthly report of the Bureau of Statistics affords the following comparison of exports of copper from the United States:

	February,		Eight months ending February 28.	
	1893. Tons.	1892. Tons.	1893. Tons.	1892. Tons.
Ore—To				
United Kingdom	1,300	2,723	26,708	20,315
Germany	....	....	78	2,013
Other Europe	....	....	....	100
Total	1,300	2,723	26,786	21,428

	—February.—	
	1893. Pounds.	1892. Pounds.
Ingots—To		
United Kingdom	225,000	445,815
Germany	172,516	1,045,483
France	823,740	991,847
Other Europe	917,075	554,425
Other countries	....	5,000
Total	2,138,329	3,042,570

	Eight months ending —February 28.—	
	1893. Pounds.	1892. Pounds.
Ingots—To		
United Kingdom	1,969,117	12,296,571
Germany	2,260,306	5,312,537
France	7,063 087	17.8 5,288
Other Europe	6,605,578	10,695.110
Other countries	57,787	46,031
Total	17,955,875	46,205,567

Pig Tin.—The enevitable working of the law of supply and demand has dispelled the visions of the "bull" interest and turned prospective profits into realistic losses. The McKinley duty "boom," has disappointed its fathers, chiefly because of the fact that sellers on one end of the line have put out more Tin than the buyers on the other end could conveniently take care of. The accumulation has become burdensome to an extreme and the odds are that the surplus will be heavier at the end of the present month. There is more than a bare chance also that "invisible" supplies will have some weight during the interval. A reflection of what the "bull" interest have to contend against may be discovered in the statistics presented below. Since our last report, the net cash price for Straits Tin has dropped about 40¢ ℔ 100 lb. Numerous "short" sales were covered at the decline, and advantage was taken of "seller's right to double" contracts in a manner anything but pleasant to operators who bought on that form of contract. Trade and consumptive demand has been only fair and doubtless checked to some extent by the depressed condition of the market.

Below we give the total statistics for Europe and the United States, as compiled by the New York Metal Exchange, showing: Total visible supply April 1, 1893, 17,855 tons; against total visible supply March 1, 1893, 15,959 tons; against total visible supply April 1, 1892, 13,039 tons.

Shipments During March and February.

	Mar. Tons.	Feb. Tons.
Straits to Great Britain	3,750	1.450
Straits to Continent Europe	350	325
Straits to United States	1,080	880
Total from Straits	5,180	2,655
Australia to Great Britain	250	180
Australia to United States	50	50
Total from Australia	300	230
London to United States	2,050	600
Holland to United States	40	140
Total from Europe	2 090	740

Consumption, London deliveries,	1,500	1,380
Consumption, Holland deliveries,	710	700
Consumption, U. S., excl. Pacific ports	1,800	1,600
Total	4,010	3,680
Stock, London	3,558	4,350
Stock, Holland	1,720	1,220
Stock, U. S., excl. Pacific ports,	3,692	2,864
Total stock at the close of month	8,970	8,434
Afloat, London	5,000	3,685
Afloat, Holland	600	1,020
Afloat, U. S., excl. Pacific ports,	3,285	2,820
Total afloat at the close of month	8,970	7,525

Pig Lead.—During the greater portion of the week under review prices dragged on the level of 4.05¢ for Common Domestic and 4.10¢ for corroding quality. In the interval somewhat extensive purchases were made by large consumers that not only cut rather deeply into spot stocks, but materially curtailed the offering for early shipment from the West. The outcome was a hardening of prices all along the line and very firm tone to the market at the close. At this writing 4.10¢ would appear to be bottom price for common Western. Some single carload lots have been sold at that during the past few days.

Spelter.—Transactions in this market have been on a smaller scale and the demand shows hardly the degree of life that was displayed a week ago. Prospects for successful outcome of the proposed combination of producers seem somewhat dubious and that fact along with continued heavy output may account in a good measure for the more conservative tendency of buyers. However, prices are still held at 4.30¢, delivered, for carload or larger lots of prime Western brands.

Antimony.—The demand has been of merely routine character and prices are barely steady at 10¢ @ 10¼¢ for Hallett's, 10¼¢ @ 10½¢ for LX and 10½¢ @ 10¾¢ for Cookson's.

Tin Plate.—Deliveries from late heavy arrivals supply trade requirements to a great extent. The probabilities are that arrivals will continue heavy for some time, as large amounts of Plates have been shipped from abroad in order to avoid probable higher rates of ocean freight. Purchases for both prompt and future deliveries are, therefore, moderate, and the business passing is practically at old prices. Spot quotations are as follows: Coke Tins—Penlan grade, IC, 14 x 20, scarce; J. B. grade, do., scarce; Bessemer full weight, $5.50; light weights, $5.10 @ $5.12½ for 100 lb, $5 for 95 lb, $4.90, nominal, for 90 lb. Siemens Steel scarce. Stamping Plates—Bessemer Steel, Coke finish, IC basis, $5.60 @ $5.65; Siemens Steel, IC basis, $5.75; IX basis, $6.85. Charcoals—Melyn grade, IC, scarce; Crosses, $8; Allaway grade, IC, $5.70; Crosses, $6.90; Grange grade, IC, $5.80; Crosses, $7. Charcoal Ternes—Worcester, 14 x 20, $5.70; do., 20 x 28, $11.35; M. F., 14 x 20, $7.25; do., 20 x 28, $14.50; Dean grade, 14 x 20, $5.30 @ $5.37½; do., 20 x 28, $10.50 @ $10.70; D. R. D. grade, 14 x 20, $5.20; do., 20 x 28, $10.30; Wasters—S. T. P. grade, 14 x 20, $5; do., 20 x 28 $9.70; Abercarne grade, 14 x 20, $4.95; do., 20 x 28, $9.50. Black Plates for tinning, to arrive, are quoted at $3.65 @ $3.70 for IX, and $3.70 @ $3.75 for IC, to arrive.

William F. Jarvis of the Newberry Building, Detroit, has been appointed sales agent of the "Landon" Salisbury charcoal pig iron. The furnace will soon be again in blast.

Financial.

With the gradual disbursement of some $50,000,000 in the shape of interest and dividends, due April 1, all the markets experience a sense of relief. The feeling of stringency prevalent of late in all directions has undoubtedly hampered trade to no small extent; as collections have been slow, merchants could not readily sell their bills because banks had not the money to spare, and accommodations of any kind were reluctantly granted. Even now the financial future is not cleared of doubt, for, although Saturday's bank statement shows that the surplus reserve has increased and that loans were but slightly contracted, the renewal of gold exports shows that a plethora of money cannot be expected immediately. The hope of easier money and the chance of lower freight rates on the opening of navigation have both had a retarding effect. Bearing on the general topic as related to gold exports, Henry Clews says: "In view of the abnormally large stocks of exportable products, it seems almost inevitable that our exports must materially increase from this time forward; and if the exports should be proportioned to the over supplies, the outflow of gold might easily fall below the usual average. In other words, it is reasonable to suppose, all other things being equal, that during the next three months the merchandise exports will largely take the place of gold shipments." This view is strengthened by the lower price of wheat since the defeat of the Chicago clique, also by the break in pork and provisions, and the improved outlook for the foreign consumption of cotton, the export demand for these commodities having already revived. On Monday the failure of the Commercial Bank of Australia was used against the market.

Stocks, after a severe hammering, took a favorable turn, in prospect of easier money and large railroad earnings as a consequence of the World's Fair boom. On Monday Western stocks were slightly affected by the threat of engineers and firemen at Toledo to strike rather than to handle cars or freight of roads connecting with the Toledo, Ann Arbor & North Michigan. The news of the engagement of $1,500,000 gold for export to Europe had little effect. The decision of Judge Ricks in the United States Circuit Court at Toledo against the striking engineers imparted a firmer tone to Western railroad stocks. Manhattan was the feature, and was largely sold on the report that a syndicate is ready to provide capital for an underground rapid transit system. All the industrials were erratic. Cordage advanced rapidly and Chicago Gas was freely bought. Sugar was inclined to sag on the report of a proposed new investigation into the company's organization and methods.

United States bonds were strong at the the following quotations:

U. S. 4½s, 1891, extended	99⅛
U. S. 4s, 1907, registered	113
U. S. 4s, 1907, coupon	113
U. S. currency 6s.	105

The loan market during the week reflected the preparation made for April disbursements. Time loans were in good demand, 6 per cent. being still the usual rate on such contracts, and in some instances bankers stipulated for gold rates. The market for commercial paper was again restricted, and the Street rate for the best names was about 7 per cent. The bank return showed a gain of $1,376,300 in cash, and of $1,419,875 in surplus reserve, which now stands at $10,663,075. The outflow of gold is supposed to depend mainly upon the condition of the loan market in New York. As concerns the Treasury at Washington, New York bankers feel no solicitude, the receipts from customs duties having surprisingly increased and various economies have been introduced. So it is believed that the Department can pull through until Congress meets. Receipts from all sources for the three-quarters of the current fiscal year aggregate in round numbers $296,000,000, against $268,000,000 for the same months of the preceding fiscal year, while expenditures during the last nine months were $298,000,000, against $269,000,000 during the corresponding months of the preceding year.

The grain market has been weak under the influence of speculation, wheat closing a fraction lower. Trading in cotton and raw sugar was much more active, at an advance, refined improving about ¼ cent per pound. Coffee quiet. Dry goods in some directions were easier.

The history of the Sherman silver law shows that from the beginning of its operation silver has constantly declined in value. The amount purchased up to December 31, 1892, cost $124,652,429, averaging $0.96 per ounce, and purchases last year cost $47,394,291, averaging $0.875 per ounce. The amount stored in bars January 1, 1893, cost $96,499,989.

Exports of merchandise from New York for the week were $6,461,000, and since January 1 $90,269,000, against $114,683,000 for the same time last year. Imports for the week $14,331,000, and since January 1 the increase is $30,000 000.

Coal Market.

The Coal market is dull and slumpy all around. Just now the Bituminous trade is exercised on account of the low contract of the Long Island Railroad Company which has been closed with R. B. Wigton & Co., at less than $2.70 ℔ ton for 80,000 tons, delivered at Hunter's Point. It is known that the railroads were expecting to get 15¢ more ℔ ton for transportation, but with such prices as that just quoted operators do not see how this can be done. Bituminous Coal is in good supply, so that some of the Clearfield mines are known to have shut down, as supposed from the effects of severe competition.

In the Anthracite Trade the resignation of Mr. McLeod from the Reading is startling news, as nothing of the kind was looked for. The trade reasons that he was simply crowded out, the funds at command proving insufficient to carry through the immense projects of the combine. Of course the combine no longer exists, nor has it been extant since the withdrawal of the Jersey Central. The Reading and Lehigh are alone, under a single management. "Company prices" now rule, and these several companies fall back as they were, renewing former tactics, which meant little more than meeting once a month or so, agreeing to maintain a schedule, and each concern afterward doing as it thought best. Prices remain unchanged, McLeod's retirement being too recent for effects to be seen or even conjectured. Talk of an advance in June or any other time this season is absurd, unless it is intended simply to be made on paper. The April output is calculated at 3,000,000 tons. The Reading Railroad has reduced the rate of tolls on Anthracite from the Schuylkill region 5¢ ℔ ton, the new rates being $1.70 ℔ ton for prepared sizes, $1.40 for Pea, and $1.25 for Buckwheat. The Reading tonnage for week was 400,000 tons, of which 55,000 tons went to New York waters. Pennsylvania Railroad tonnage for week, 336,958 tons Coal and 112,824 tons Coke. Increase for one year 443,000 tons.

New York.

Office of *The Iron Age*, 96-102 Reade street, NEW YORK, April 5, 1893.

Pig Iron.—The market is very quiet, although it is pointed out as a feature that quick delivery is usually demanded by consumers. Both Alabama and Virginia Irons are occasionally pressed for sale. We quote Northern brands at $14 50 @ $15.25 for No. 1; $13.75 @ $14.50 for No. 2; $12.75 @ $13 50 for Gray Forge, tidewater. Southern Iron, same delivery, $14.25 @ $14 50 for No. 1; $13 @ $13.75 for No. 2 and No. 1 Soft; $12 @ $12.50 for Gray Forge.

Spiegeleisen and Ferromanganese.—An Eastern Rail mill has taken a block of 5000 tons of German 10 to 12 per cent. Speigeleisen, in addition to about 3000 tons of 20 per cent. English Spiegeleisen purchased about three weeks since. Ferromanganese is selling at $57 @ $57.50 ex-ship, the business being quiet, with the majority of importers quoting higher figures.

Billets and Rods.—The works nearest to this market are reported to be full of orders, having taken large business from an Eastern Wire mill some time since. It is reported that an effort is being made to contract for Billets for delivery in the Chicago district with tidewater works. A mill in Eastern Pennsylvania is also in the market for 5000 tons of Wire Billets. We quote Steel Billets, tidewater, $25 @ $25.25; foreign, $29 @ $29.50; Wire Rods, $33.00 @ $33.50; foreign Wire Rods, nominally, $40 @ $40.50, and Swedish Rods, $52.50 @ $53.

Steel Rails.—Sales by Eastern mills aggregate only about 8000 to 9000 tons, including one block of 5000 tons. The market continues quiet, with the majority of roads in this territory pretty well covered for renewal requirements, and little new construction work coming up. The policy of laying Rails running from 80 to 100 pounds to the foot is bringing into the market considerable quantities of 60 to 70 pound Rails, which are offered as fit to relay. In some cases, however, they will probably have to go as scrap. We quote $29, mill or tidewater, for Standard sections and $31.50 @ $32.50 for Girder Rails.

Track Material.—Spikes are quoted at 1.90¢ @ 1.95¢; Fish Plates at 1.55¢ @ 1.60¢; Track Bolts, square nuts, at 2.45¢ @ 2.50¢, and hexagon nuts at 2.55¢ @ 2.60¢, delivered.

Manufactured Iron and Steel.—Aside from a good run of small orders there is nothing of special interest to report, no contracts of magnitude having been placed outside of the Kuhn-Loeb building. There is a good deal of figuring being done, however, and quite a number of office structures of moderate size will be closed soon. The consumption of small lots of Beams for apartment houses, tenements and stores promises to be exceptionally heavy this year. A very heavy piece of work in the way of elevated structure is now in the market for the Park avenue improvement, in which the city and the New York Central road are interested. We understand that this will call for about 17,000 tons of Structural Material, and that the bids are to be opened towards the close of this month. In Plates there have again been evidences of extreme irregularity. The material for two ships at Newport News is soon to be placed. We quote: Beams up to 15 inch, 1.95¢ @ 2.15¢; 20-inch, 2.30¢ @ 2.40¢ for round lots; Angles, 1.8¢ @ 2¢; Universal Mill Plates, 1.85¢ @ 1.90¢; Tees, 2.10¢ @ 2.30¢; Channels, 2.10¢ @ 2.20¢, on dock. Car Truck Channels, 2¢ @ 2.10¢. Steel Plates are 1.80¢ @ 2¢ for Tank; 2.10¢ @ 2.25¢ for Shell; 2.25¢ @ 2.50¢ for Flange, and 2.50¢ @ 2.80¢ for Fire Box, on dock. Refined Bars are 1.65¢ @ 1.9¢, on dock, and common 1.55¢ @ 1.60¢. Scrap Axles are quotable at 1.90¢ @ 2.10¢, delivered. Steel Axles, 1.85¢ @ 2¢, and Links and Pins, 1.85¢ @ 2.10¢; Steel Hoops, 1.80¢ @ 1.90¢, delivered; Cotton Ties, 80¢ ℔ bundle, at mill.

Merchant Steel.— The market is dull, with Machinery at 1.75¢ @ 2¢; Toe Calk, 2¢ @ 2.25¢; and Sleigh Shoe, 1.75¢ @ 1.90¢.

Old Material.—With the approach of the active period of track renewal, a good many Old Rails are being offered in the market, in the face of a very considerably restricted consumption. So many of the rolling mills which depended largely or wholly upon Old Iron Rails as their raw material have gone over to Steel Billets, that the days seem over when it was possible at nearly all times to place large blocks at a price. How great in dollars the difference between Steel Billets and Old Iron Rails must be to induce buyers to take hold of the latter has not, we believe, become generally known in the trade. Data relating to this subject would be of great interest. As we have stated, the offerings are quite large relatively. We know of one block of 5000 tons at Chicago, one of 2000 tons at St. Louis, of 4000 tons in New York and 2000 tons in New England, all seeking buyers. In Old Steel Rails, the offerings are also large. About 8000 tons are seeking buyers in New York and 2000 tons in New England. We quote nominally $16.50 @ $17 for Old Iron Rails; $13 @ $13.50 for Old Steel Rails; $15.75 @ $16 for No. 1 Scrap, and $12.50 @ $13 for Old Car Wheels, f.o.b. Jersey City.

Stock Warants.—Return of stocks, &c., by American Pig Iron Storage Warrant Company.

	Tons.
Stock in yard February 28, 1893.....	78,900
Put in yard for 31 days ending March 31, 1893.....	1,300
Total.....	80,200
Withdrawn 31 days ending March 31, 1893.....	2,300
Net stock in yard March 31, 1893	77,900

Pittsburgh.

(By Mail.)

Office of *The Iron Age*, Hamilton Building, PITTSBURGH, April 4, 1893.

The first week in the second quarter of the year does not present any specially new features over the closing week in March. The higher prices for Bessemer Pig and Billets are being fairly maintained, with only a limited demand for both. In Wire Nails and Wire, further sharp advances have taken place during the week, with some concerns unable to take additional orders for delivery within the next 60 or 90 days, as their product is entirely sold up, some as late as July. Wire Rods, which have been dull and neglected for so long, have advanced fully $1.50 ℔ ton within a month, with the demand considerably improved. In Structural Material and Plates the condition of trade is not satisfactory, either as regards demand or prices. The fear is being expressed that possibly the makers of Plates and Structural Shapes expected a heavier trade than will be realized. Capacity for production in both lines is extremely large and it will require a tonnage out of the ordinary to keep everybody busy. Pipes and Tubes are a little better in demand and price, and some very low quotations have been withdrawn.

As the time approaches for the Amalgamated Association of Iron and Steel Workers to hold their annual convention in this city, the usual rumors are afloat in regard to strikes and lock outs. Little reliance should be placed upon these rumors. It is the impression in well-informed quarters that the different wage scales for 1893–94 will be arranged this year between manufacturers and workmen without recourse to strikes or lockouts.

Bars.—Within the past week or two the call for Bars has improved considerably, and the outlook at this time is much better. Orders from country customers are increasing, and, with the roads in good condition again, there will doubtless come a good tonnage from this class of trade. Railroads are also buying more freely, so that all in all the situation has considerably improved. On account of the advance in Billets, prices of Steel Bars are firmer, and we now quote at 1.55¢ @ 1.60¢, half extras. In the Mahoning Valley, Bars are held at 1.42½¢ @ 1.45¢, half extras, at mill.

Structural Material.—Considerable disappointment is being expressed by makers here over the fact that the demand which was expected to come with the opening of spring trade has not as yet made its appearance to any marked extent. A month or two ago all indications pointed to a very heavy tonnage in Shapes of all kinds, and while it is true that a fair tonnage is going in small lots, the demand at this time is not anything like as large as makers expected. Prices, too, have not shown any inclination to advance, but on the contrary have weakened to some extent, and we now quote Beams and Channels on a basis of 1.75¢ @ 1.80¢, f.o.b. cars Pittsburgh; Angles, we quote at 1.65¢ @ 1.70¢; Z Bars, 1.85¢ @ 1.90¢, and Tees at 1.90¢ @ 2¢.

Plates.—The best that can be said this week under the above head is that a moderate amount of business is going, and prices are fairly well sustained. The demand for Boiler Plate at this time is quite heavy, and if the tonnage in the other kinds of Plates was as large in proportion makers would have very little to complain of as far as demand is concerned. The advance in Bessemer Pig and Soft Steel has not as yet affected Plates, and, as stated before, prices are shaded. There are no indications apparent just now of any advance in prices. We continue to quote Ordinary Fire Box at 2 25¢ @ 2 50¢; best Quality, 3¢ @ 3.25¢; Flange, 1.90¢ @ 2¢; Tank, 1.65¢ @ 1.70¢; Shell, 1.75¢ @ 1.80¢; Universal Plates, 1.70¢ @ 1.75¢.

Ferromanganese.—A fair demand is going, with prices unchanged on a basis of $59 @ $59.25 for 80 %, f.o.b. cars Pittsburgh.

Muck Bars.—Demand continues dull, and within the past week or two prices have eased off to some extent, and we now quote Muck Bars of best grade at $24 @ $24.15, f.o.b. cars Pittsburgh. We note a sale of 300 tons at last named price for April delivery.

Wire Rods.—Owing to increased cost of Billets and also a materially improved demand, prices on Wire Rods have scored an advance within the past week, and the market is firm on a basis of $31, f.o.b. cars Pittsburgh. Offers of $30 50 within the past week have been declined by makers in Pittsburgh and also in other sections.

Wire and Cut Nails.—As announced last week, a meeting of Wire Nail manufacturers was held in the Weddell House, Cleveland, on Thursday, March 30, which was well attended, every member of the association being present with the exception of one or two concerns in Pittsburgh. At this meeting it was decided to advance the price of Wire Nails to $1 55, base, in carload lots, f.o.b. cars, Pittsburgh or

Cleveland district. From the fact that nearly all the mills are filled up with orders for the next two or three months, there seems to be little doubt that this price will be maintained, and from several quarters come intimations that within the next two or three weeks a further advance will be made. Assurances from makers warrants the statement that the Wire-Nail trade is probably in better condition to-day, both as regards demand and price, than for a long time. Even at the advanced price noted above, many concerns are utterly unable to book additional orders for delivery before July 1, as their product is entirely sold up to that date. In the Cut-Nail trade an improved condition of affairs is noted, and the demand at this time is better than for some months past. Mills are adhering very closely to the new card, and, except for very large blocks, the claim is made that it is not being shaded.

Steel Rails.—The Edgar Thomson Mill continues on Rails and it is understood to have sufficient orders on hand to take its output for some little time. A material improvement in demand is expected from this time forward on account of additions to track equipment, which must be made within a short time by railroads in order to take care of their World's Fair traffic. Prices are unchanged at $29 at mill for Standard sections

Wire.—The very satisfactory condition of affairs in the Wire trade noted in these colums for some weeks past continues, and the situation is improving right along as far as prices are concerned. Within the past week a further advance of about $1 ℔ ton has taken place, and we now quote Galvanized Barb Wire at 2.60¢ in carload lots and 2.65¢ in less quantities. Painted Barb Wire is also firm and in heavy demand at 2.20¢ in carload lots and 2.25¢ in less quantities. The continued advance in prices of both Painted and Galvanized Barb Wire do not seem to affect demand any, which is as heavy to day as at any time within the past month or two. The recent advance in Plain Wire is firmly sustained, and we continue to quote Nos. 6 to 9 at 1.70¢ in carload lots and 1 75¢ in less quantities. Nos. 10 and 11 we quote at 1.80¢ @ 2¢; No. 12 at 1 90; No. 13 at 2¢ and No. 14 at 2.15¢.

Skelp Iron.—The market is in the same condition as noted last week, a fair demand is going, but prices are low and do not show any indication of betterment in the near future. We continue to quote Grooved at 1.50¢ @ 1.52½¢; Sheared at 1.70¢ @ 1.72½¢, four months, or 2 % off for cash.

Sheets.—A heavy business is going, and the fact that makers are not willing to book orders for delivery after July 1 has naturally resulted in a rush of orders for delivery before that date, which is keeping the mills running to their utmost capacity in order to turn out product as fast as required. Prices are firm, and we quote Ordinary Box Annealed Sheets as follows: No. 24, 2 50¢ @ 2 55¢; No. 26, 2.60¢ @ 2.65¢; No. 27, 2.70¢ @ 2 75¢ As noted last week, makers are charging about $2 ℔ ton advance on above prices for Soft Steel Sheets, on account of the advance in price of Billets.

Scrap Iron and Steel.—A material improvement in demand for certain kinds of Scrap Material is reported, but with one or two exceptions there has been no improvement in price. We continue to quote No. 1 Railroad Wrought Scrap at $15 ℔ net ton; Cast Iron Borings at $8 ℔ gross ton; Wrought Iron Turnings $10 ℔ net ton. Leaf Springs are scarce and in active demand, and are bringing $21 ℔ gross ton; Coil Springs are in limited demand at $18 @ $18.25 ℔ gross ton, while Old Car Wheels are higher and are selling at $13.50.

Old Rails.—A fair demand is reported for Old Steel Rails, and we quote long and short lengths at $15.50 ℔ gross ton; mixed Rails at $14.25 ℔ gross ton; Iron Rails are in slow demand and are bringing $19.50 ℔ gross ton, f.o.b. cars Pittsburgh.

Connellsville Coke.—For the week ending March 25 there were 12,932 ovens in the Connellsville region in blast, 4395 idle, with a production for the week of 125,820 tons. Prices do not show any change, and we continue to quote Furnace Coke at $1.60, f.o.b. cars in Connellsville region. It is claimed that $1.50 has been named in some recent transactions. Foundry Coke is held at $2.15 to dealers and $2.30 to consumers.

(*By Telegraph, 1 p.m., April 5.*)

Pig Iron.—The market on Bessemer Pig is admirably described by the word "easy," and this applies to both demand and prices. For the week under review there were very few transactions, and these for small lots, ranging from 300 to 500 tons. As was pointed out several weeks ago, the advance in Bessemer Pig considerably strengthened the position taken by the Ore men on prices for this year, and as a result, the two large buyers of Ore have not covered their requirements. Following out this line of reasoning, it will be seen that the immediate interests of the two concerns who make more than one-fifth of all the Pig Iron made in this country will be better served by at least temporary lower prices on Bessemer Pig. At this time all conditions surrounding the market point to a decline in values for a time at least. Large consumers have their wants covered for some time, and in one case, that involves a good many thousand tons of Bessemer, furnaces have been asked to defer shipments, and some of this Iron, that will not be wanted by the concern during April and May, has been offered in the open market at prices equal to $13.90, Pittsburgh, and less. In addition to this, every stack in Allegheny County was active in March except Soho, and, as a consequence, production was extremely heavy, running close to 175,000 tons. From this it will be seen that all conditions point to lower prices on Bessemer for a time at least. After Ore contracts are arranged it is not improbable that there will be a sudden recovery of values. While we quote Bessemer as low as $13.75, Pittsburgh, it should be noted that the few sales reported within the last week have been at slightly higher figures. We quote as follows:

Neutral Gray Forge	12.25	@	cash.
All-Ore Mill	12.50	@	"
No. 1 Foundry	13.75	@ 14.00.	
No. 2 Foundry	12.75	@ 13.00	"
Charcoal Foundry No. 1	17.00	@ 18.00,	"
Charcoal Foundry No. 2	16.50	@ 17.00,	"
Bessemer Pig	13.75	@ 13.90,	"

We note two sales of Bessemer for April delivery, aggregating 800 tons, at $13.90, Pittsburgh.

Billets.—The market is extremely quiet and buyers have apparently deserted the field and are content to run the risk of having to pay advanced prices when they must again enter the market. On the other hand, there is no pressure on the part of mills to seek contracts until those already in hand have been cleared up or nearly so. The peculiar conditions surrounding the Bessemer Pig market just now are being reflected to some extent in Billets. In some quarters the impression prevails that Steel at $23 is as high as it will go, and should any marked decline occur in Pig it will be felt in Billets also. Already reports are going of Steel being offered at $22.75 for May and June. However, the fact that Duquesne is off and that a plant in the Wheeling district will soon close for extensive repairs should have the effect of preventing any marked decline in values.

The Penn Bridge Company, Beaver Falls, Pa., contractors and manufacturers of Bridges and Structural Material in Iron or Steel, are completing an iron mill building for the Sharon Iron Company, Limited, Sharon, Pa., and have lately been awarded a contract at Uniontown, Pa., for a bridge with 50 foot span, 32-foot roadway and two sidewalks 12 feet each. Also for bridge at West Middlesex, Pa., 185 foot span, 20-foot roadway and sidewalks. In addition to the above they have a number of small contracts on hand and are operating their works full time in all departments.

Baltimore.

BALTIMORE, April 4, 1893.

Quite a good deal of business is on the market here at present, principally Plate and Structural Material, though other classes are by no means in as bad a condition as two months ago, when sellers wondered if there would ever be a call for fair-sized lots again. Despite the indications of stiffer prices a Bar Iron order was placed during the week with a local house at a lower price than has been known of this year. Machinery Steel of various classes has dropped in price, owing to competition on some orders a little greater in magnitude than ordinary. To sum up the whole matter, it is doubtful if Iron and Steel products are being sold anywhere in the country on as small margins as they are being sold here.

Bar Iron.—We continue our quotations, although it is notorious that special orders have been placed during the past week at considerably lower prices. The business ahead seems to be fair in quantity and the mills seem to be determined to advertise for future business by making great inducements now. We quote from stock, 1.80¢ @ 2¢; from mill, 1.70¢ @ 1.80¢.

Plates.—These seem to be in the same unsettled condition as reported last week. Both the Eastern and Western mills seem to claim this city and territory and are fighting for it, with the odds in favor of the East. We quote Tank Steel and Iron, 1.80¢ @ 1.90¢; Shell, 2.15¢ @ 2.25¢; Flange, 2.30¢ @ 2.40¢; Fire Box, 2.45¢ @ 2.55¢; Marine, 2.45¢ @ 2.55¢.

Merchant Steel.—Prices on Merchant Steel are now in the condition of other products, owing, as stated above, to competition on special business. Machinery Steel is quoted 2.10¢ @ 2.25¢; Tire Steel, 2.20¢ @ 2.30¢; Spring, 2.45¢ @ 2.55¢; Toe Calk, 2.25¢ @ 2.35¢.

Tubes and Pipe.—Boiler Tubes have been active but Pipe dull. Tubes are quoted 70 % all sizes on new list.

The *Verein Deutscher Eisenhuettenleute* has just issued a revised edition of standard specifications for iron and steel. They cover rails, steel sleepers, angle bars tires and axles, structural shapes, plates and sheets, merchant iron and steel, wire, and iron and steel castings.

British Iron and Metal Markets.

[*Special Cable Dispatch to The Iron Age.*]

LONDON, WEDNESDAY, April 5, 1893.

Warrant speculations have been very tame and prices have moved irregularly, without, however, showing any radical change. Scotch moved up to 40/10½ and Hematites receded to 45/4½, the latter being in very poor demand. Cleveland has moved up to 34/6 and appears to be the favorite with some operators since merchants and consumers have manifested some disposition to increase their holdings, despite the accumulation latterly of stocks in makers' hands, on the belief that prices will improve later on. Stocks in public stores include 342,700 tons Scotch and 60,000 tons of Cleveland Iron.

There is some sign of improvement in various branches of the Steel trade, and Bolckow's Eston works are about to be restarted.

Prior to the Easter holidays, prices for Pig Tin were held firmly, but resumption of business was characterized by depression, due to advices of heavy shipments from the Straits last month and unfavorable advices from America. On Tuesday sales were made of prompts at £93. 10/, and futures at £2 @ £3. 10/ discount.

Copper prices have been quite steady, although holidays interfered with business to a greater or less extent. Demand from consumers is very conservative, however, and the undertone of the market is easier than it was a week ago.

For Tin Plate several good orders have been placed, in which Bessemer Cokes figured conspicuously at somewhat better prices. There is quite a good demand for squares and Oil sizes at prices averaging about 3d. advance on late quotations. Stocks at shipping ports amount to 215,000 boxes, against 206,000 boxes at the corresponding period last year. Output increases, however, with expansion of demand. The Hendy Works have restarted during the week.

Scotch Pig Iron.—Market for all brands is quiet and prices remain stationary.

No. 1 Coltness,	f.o.b.	Glasgow	74/
No. 1 Summerlee,	"	"	49.6
No. 1 Gartsherrie,	"	"	47 6
No. 1 Langloan,	"	"	53/
No. 1 Carnbroe,	"	"	43/6
No. 1 Shotts	"	at Leith	53/
No. 1 Glengarnock,	"	Ardrossan	48.6
No. 1 Dalmellington,	"	"	46 6
No. 1 Eglinton,	"	"	44/

Steamer freights, Glasgow to New York, 2 6; Liverpool to New York, 7/6.

Cleveland Pig.—Only moderate business, but prices firmer at 34/6, f.o.b. shipping port, for No. 3 Middlesborough.

Bessemer Pig.—Warrants improved to 46/ at the close, but makers are free sellers at 47/ for West Coast brands, Nos. 1, 2 and 3, f.o.b. shipping port.

Ferromanganese.—Demand moderate, but prices quite firm. English 80 % quoted at £10. 15/, f.o.b. shipping port.

Steel Rails.—A moderate business passing and prices barely steady. Heavy sections quoted at £4, f.o.b. shipping port.

Steel Slabs.—Market continues very quiet and prices are without change, but rather soft. Bessemer quoted at £4, f.o.b. at shipping point.

Steel Billets.—Demand is moderate and the business passing is chiefly at old prices. Bessemer, 2½ x 2½ inches, quoted at £4. 2/6, f.o.b. shipping point.

Steel Blooms.—Market very quiet and without change. Makers quote £4 for 7 x 7, f.o.b. shipping point.

Old Iron Rails.—A moderate business passing at about former prices. Tees quoted at £2. 7/6 @ £2. 10/ and Double Heads at £2. 10/ @ £2. 12/6, f.o.b.

Scrap Iron.—Demand moderate, but prices quite steady. Heavy Wrought Iron quoted at £2, f.o.b.

Crop Ends.—Little doing and prices nominal. Bessemer quoted at £2. 7/6 @ £2. 10/, f.o.b.

Manufactured Iron.—Orders continue moderate numerically, and are chiefly for small quantities. Prices rather soft, but show no radical change. We quote, f.o.b. Liverpool:

	£	s.	d.		£	s.	d.
Staff. Ordinary Marked Bars	8	0	0	@	.....		
" Common "	6	5	0	@	6	7	6
Staff. Bl'k Sheet, singles....	7	7	6	@	7	10	0
Welsh Bars (f.o.b. Wales)....	5	7	6	@	5	10	0

Tin Plate.—Market closes quiet, but offerings are reserved and prices quite firm. We quote, f.o.b. Liverpool:

IC Charcoal, Alloway grade	13/6 @ 14/0
IC Bessemer Steel, Coke finish	12/0 @ 12/3
IC Siemens " " "	12/3 @ 12/6
IC Coke, B. V. grade 14 x 20	12/0 @ ....
Charcoal Terne, Dean grade	13.6 @ 14

Pig Tin.—Market dull at the close, but steady. Straits quoted at £93. 15/ for spot and £91 nominal for three months' futures.

Copper.—Market closes quiet and easy. Merchant Bars quoted at £45. 2/6, spot, and £45. 12/6, three months' futures. Best selected, £49. 10/.

Lead.—The market has remained quiet and prices steady at £9. 15/ for Soft Spanish.

Spelter.—Demand moderate, but prices firmer at £17. 10/ for ordinary Silesian.

The German Iron Trade.

(*One mark per metric ton is equivalent to 24.8 cents per gross ton.*)

DUSSELDORF, March 18, 1893.

The slight improvement which begun to be felt recently has continued, and has made some progress. For high grade Mill Iron and Thomas Pig from 36.12¢ to 48.16¢ ℔ ton more is realized, while Foundry Iron and Bessemer Pig retain their former level, which, it is true, has for some time past been relatively higher. Prices for partly manufactured articles have made more progress, and Steel Ingots are not now available under $17.85, while Billets have risen to $18.35 @ $18.84 and Slabs to $19 34 @ $19.84. Scrap has risen considerably in consequence of a strong demand from Open-Hearth plants, $13.64 now being quoted for best assortment. Latterly Open-Hearth melters have turned their attention to Low Silicon and Low Manganese Pig Iron, which is growing in favor as a substitute for Scrap.

Imported Ores are low in consequence of the depressed freight market, but Siegen Spathic Ores and Puddle Cinder have risen considerably. The latter is quoted $37.20 ℔ car of 10 tons. In Bars business is decidedly active, and Wrought Iron is now quoted $27 77 @ $29.02, while Soft Steel Bars are $26.78 @ $27.77. Plate makers are getting more orders, but prices are still very low. The Styrum Rolling Mill, which stopped operations half a year ago, intends to resume plate mill rolling at an outlay of $62,000. There is quite an active demand for Beams and other Structural Shapes, but prices are rising very slowly. For Track Material the requirements of the Baden and Prussian State railroads have been closed at lower figures than those of a year since. The lowest offer for 24,000 tons for the former was $28 74 by Summ Brothers. The firm of F. Krupp, at Essen, have taken 2550 tons of Steel Rails for the Dutch line Herzogenrath Einehoven, at 53 florins 40 centimes, delivery Amsterdam.

The Effect of Melting Pig Iron.—The Valentine Iron Company of Bellefonte, Pa., have just issued the first number of a small publication called the *Nittany Bulletin*, which deals with their Nittany brand of foundry iron. From it we glean the following chemical data bearing on a recent experiment made by them to show the chemical change which takes place in the cupola. The following table shows the change in the chemical composition of iron as the result of remelting, the analysis given being that of the pig iron and of the resulting castings, one a heavy piece of machinery and the other a thin plate $\frac{1}{16}$ inch in diameter:

	Pig iron.	Large casting.	Small casting.
Silicon	2 680	2 610	2.380
Graphitic carbon	3.140	3 420	2.980
Combined carbon	0.740	0 100	0.430
Manganese	0 654	0.397	0.490
Phosphorus	0.508	0.530	0.562
Sulphur	0.041	0.089	0.087
Iron	92.230	92 850	93.130

The melt was made with a 48-hour coke having 1.46 per cent. of sulphur, which explains the increase in the sulphur contents in the casting.

New South Wales, Australia, is sadly in want of an able financier to straighten out the pecuniary muddle in which the Government appears to be floundering. The condition of the colony, regarded in the light of property, leaves little to be desired. But she is saddled with a public debt of $260,000,000, and, notwithstanding the splendid security she has to offer in public assets, including unsold lands and productive works estimated at nearly $910,000,000, she finds it a hard matter to borrow money for present needs. Her population is increasing, having risen from 782,030 in 1881 to 1,132,324 in 1891, and her revenue has increased proportionately in the same ten years, namely from $82,250,000 to $48,000,000. The exports of domestic produce have advanced from $57,580,000 in 1881 to $101,300,000 in 1891; while the increase in total trade, intercolonial and external, is no less remarkable, having advanced from $158,400,000 to $232,000,000. Moreover, the present value of private estate in the colony is assessed at nearly $2,000,000,000. The reason given for the hesitation of foreign capitalists to advance money to the New South Wales Government is distrust of their financial methods and fear of the labor party, which is not unlikely to succeed to the control of the trade and industry of the colony.

A manual training school is to be established in Detroit similar to schools in Toledo and Springfield, Ohio, under the management of the Y. M. C. A. Detroit already has 200 young men studying in the mechanical branches.

HARDWARE.

Condition of Trade.

REPORTS of the amount of goods distributed by the trade in all parts of the country continue good. Large quantities are now going into consumption everywhere. Indeed, many lines are moving off so rapidly that it is difficult to get orders promptly filled. This is particularly true in the case of seasonable goods. Manufacturers generally report a good volume of business, and very many are behind their orders. Collections, except in some localities, are fairly good.

Chicago.

(By Telegraph.)

The demand for Hardware is increasing steadily. Jobbers anticipate a very heavy April trade, looking for a great deal of business which is usually done in March, but which was checked this year on account of the prolongation of winter weather. Spring appears to have opened to stay, as over a week of mildness has now been experienced through the Northwest. The improved weather has brought with it a much better demand for Tin Plates, especially for ternes, as the construction of buildings is being vigorously pushed. Wire Cloth is exceedingly scarce, and is now held by jobbers at $1.40, with an advancing tendency. Stocks in Chicago are reported to be hardly equal to the wants of the city itself. The multitude of structures of all kinds now nearing completion on the World's Fair grounds and in the immediate vicinity has caused a very heavy demand for finishing Hardware, and many contractors are in straits because they cannot get supplies which they have deferred buying until they were actually needed.

St. Louis.

(By Telegraph.)

The demand for Shelf Hardware is on the increase, and jobbers report good quantities included in nearly every order received. In the line of Garden Tools and Agricultural Implements a steady demand is noted, and heavy orders are received for hot-weather goods. The pleasant weather prevailing for the past week has shown its beneficial effects on the size of country orders now being received. The Southern trade is in excellent shape and promises to be large. Wire Nails and Barb Wire are in heavy demand and prices are fairly well maintained. Copper goods, Tin Plate and Builders' Hardware are moving in large volume and prices are firmer in consequence.

Louisville.

W. B. BELKNAP & CO.—Almost every mail brings us in notice of slight advances in some line of manufactured goods or in Wire and Steel products. The demand for Plain and Barbed Wire and Wire Nails is well kept up, incidental to the fine weather of spring and the widespread building operations projected and in process.

It really looks at last as though the mills had gathered a little nerve to take advantage of the market conditions for realizing better profits.

Buying movement has been active, and large orders placed for Iron, Sheet, Wire and Staples generally, the prices of which are recognized to be necessarily near bottom.

The low price of wheat and flour is a little staggering to our farmers and millers, but the idea prevails that there will be some good use for wheat, even if more or less of it has to be fed to the hogs, as we hear is the case in the far West.

The money market has been working rather tight here, incident to the failure of a large bank in Nashville (which, however, was brought on by palpable speculations and such practices as would break any institution, if we understand them aright); also locally by the discovery of the use, by one firm here, of a quantity of forged warehouse receipts for whiskey. The banks have been badly bitten here for the fifth time, according to those who keep tally. It is only reasonable to expect that the process will continue periodically until somebody is punished, and punished severely. In the other cases, all or nearly all, have been pardoned, the indictments dismissed, and the offenders permitted to come back and move in the social and business circles without prejudice. What is necessary for the prevention of this sort of crime in any community is a little less blind credulity on the part of the bank and decidedly more prompt and persistent punishment on the part of the Commonwealth.

Baltimore.

CARLIN & FULTON.—Though orders from the cotton States have, as usual at this time of the year, greatly diminished and are confined generally to the leading staples, we are glad to report an active trade from all other sections.

In our own city it is wonderful to see what an effect the present favorable weather has had on all outdoor work, and just now every contractor is pushing with the greatest vigor the construction of the great enterprises of the Belt Railroad, and immense sums of money are being expended in the transformation of nearly every street car line into modes of rapid transit, some by cable, others by electricity, which, with the expenditure of $6,000,000 by the city in repaving the streets, building bridges and other works of municipal necessity, makes a most busy city.

So far little has been heard from the peach grower, who yearly laments the early demise of his crop, and consequently we infer that there will be an abundance this year of fruit of all kinds, in anticipation of which porcelain-lined Preserving Kettles have advanced in price.

The severe weather of the winter just ended having enabled nearly every one to harvest a large ice crop will cause in the opinion of all an extraordinary demand for both Freezers and Refrigerators, and it is to be hoped that the retail dealers throughout the country will not wait until the last minute to supply this certain demand.

Wire Nails and Barb Wire have both sympathized with the state of trade in their lines and advanced in price. At this time of the year it seems that nearly every house needs the services of an actuary or a competent mathematician, for nearly every mail has a number of inquiries from the individual who wants "an estimate" either to fence in a graveyard, or to build a poultry fence, or to inclose a farm with Barb Wire of a specified number of strands and a certain number of miles in length.

It is really wonderful when we think of the infinite number of calculations in weights and sizes which the Hardware business is compelled to furnish.

Collections are generally fair and we suppose are up to the average of a year ago.

St. Paul.

FARWELL, OZMUN, KIRK & CO.—The First of April brings us down close to seeding time, and before this reaches your readers in the Northwest it is probable that the farmers will be already busily engaged in putting in their crops.

From winter to spring is a rapid transition with us. One day the air sharp and wintery, and a day or two later the sun shining warm, the air mellow and the farmers busy in their fields seeding.

The past month was notable for its storms and the severity of the weather, and the agriculturalists have been hibernating to an unusual degree for the season, but the roads generally are not yet in a fairly passable condition.

This has affected trade in all lines, and the volume of business in the Northwest for the first quarter of the year has not equaled that of last year, although it has not fallen short of the expectations of conservative business men.

A very fair trade is expected from now on. Stocks in the hands of retailers are not large, and dealers have been adhering closely to the policy of buying only for actual wants.

In carrying out this policy frequent and small orders have been necessary, so that the decrease in the volume of business has been exhibited in the size and not in the number of orders received.

In this state of things orders will now necessarily be larger, as well as more frequent than would be received if the earlier orders had been larger and the dealers were stocked up for the early summer trade.

Prices continue largely without important change. Nails have been advanced, and a little firmer tone on Wire is to be noticed. Collections will improve greatly after seeding.

Philadelphia.

SUPPLEE HARDWARE COMPANY.—Trade continues active, regardless of local complaints of bad roads and consequent poor collections.

The frequent letters urging forward season goods that were booked to go at a later date indicate an early opening of spring, when Garden Tools will be needed.

The season opens with rather a scarcity than otherwise of these goods, and local manufacturers are without any overstock. Manufacturers of these goods, in recent years, have confined their production chiefly to orders that have been booked for later delivery, and depend but little upon transient orders, giving as their excuse that the present profit on their production, together with the wareroom required, will not guarantee any other plan; but should spring open as suddenly as now predicted there must necessarily be some disappointment to the trade who held off buying these goods until the last moment.

Wire Nails are in active demand at slightly advanced rates. Barb Wire remains firm at former quotations, with every appearance of a heavy spring trade on both the above articles.

Salesmen report no overstock of goods in hands of customers.

Collections may be considered below the average.

Shipments of merchandise have taxed the capacity of the railroads leaving our city, and considerable complaint is made from customers, owing to delay. Prospect of spring trade continues bright.

Omaha.

LEE-CLARKE-ANDREESEN HARDWARE COMPANY.—In its general features this market presents no changes of importance. There is a constant, steady demand for goods both from the agricultural and mining districts which aggregates a very respectable volume, so that jobbers are well satisfied with the present conditions as well as the future outlook. A cheerful tone characterizes the reports received from the interior, and prospects are generally referred to as bright and encouraging. Enterprise and progress will show a marked development during the coming months, evidences of which are daily appearing. Labor, as a rule, is well employed, and will be still more in demand as soon as the weather will permit of the resumption of building and other warm weather enterprises. Referring to city trade, the movement of goods in a retail way is not quite all that could be desired, but it is almost too early in the season to look for any great improvement. Collections on the whole may be reported as fair, with an easy money market.

Cleveland.

THE W. BINGHAM COMPANY.—While business for March can be recorded as good there is still room for improvement. The weather so far has not been conducive to brisk trade. Prices on staples are moving upward.

At a meeting of the Wire Nail manufacturers held here on Thursday the price was advanced 5 cents per keg. Wire of all kinds has also advanced $2 per ton with probabilities of a still further rise, as all the mills are behind on their orders.

Retailers in this city report trade as good, Builders' Hardware being in unusual demand.

We are sorry to report collections as poor, owing probably to the bad condition of the country roads.

Boston.

BIGELOW & DOWSE.—There is a marked improvement in general business the past two weeks. The season is about two weeks behind, but the snow has disappeared and mild weather is having a beneficial effect. Retail dealers report a good demand for general Hardware, and their orders are well assorted.

The demand for both Wire and Cut Nails is very high, and much beyond that of previous years. Buyers seem to take no notice of the late advances made by Wire-Nail manufacturers, and are not inclined to buy in advance of their wants. The nominal price for Wire Nails for stock is $1.80, base, this price being shaded on orders shipped direct from factory. If the late advance of $2 per ton on Steel Slabs is maintained, Steel Cut Nails must advance. The present price from store is $1.50, base.

The manufacturers of some of the favorite makes of Bicycles are far behind their orders, which is causing great annoyance to customers, who are anxious to have their wheels at once. The demand for high-grade machines is much greater than ever before. A line of Bicycle sundries is quite a necessary addition to a stock of Hardware, and pay a good profit to the retailers.

Everything looks favorable for a large trade in April and May.

New Orleans.

A. BALDWIN & CO.—Business still continues fairly active, especially in the builders' line. Orders are coming in much more freely than we anticipated, and the steady improvement in the building line in New Orleans is causing a considerable increase in the demand for Builders' Hardware.

Trade in Texas and Mexico is somewhat more quiet than it has been for the past 60 days. The planters are very busy in their line, and the volume of business is apt to fall off somewhat for the next 60 days.

Notes on Prices.

Cut Nails.—The demand for Cut Nails is being maintained extremely well, mills still quoting very generally $1.20 for carload lots at mill, although this price has been shaded in some instances. In New York the quotation is $1.40 for carload lots on dock and $1.60 from store.

Chicago, by Telegraph.—Cut Steel Nails are slightly lower from factory, in sympathy with lower prices circulated by Wheeling makers, and can now be quoted at $1.35, Chicago. Manufacturers here are well supplied with orders for this month, but have deemed it wise to meet changing conditions elsewhere. Small lots from stock are selling at $1.50.

Wire Nails.—The manufacturers of Wire Nails held a meeting last week, at which it was decided to make an advance in the card rate to $1.55 f.o.b. at mill, with Cleveland as the point of equalization for the West and Pittsburgh for the East. This advance is smaller than was looked for at this time, and in view of the exceptionally strong position of this article it is not unlikely that another advance will be made before long. The demand continues very large. Small lots from store in New York are quoted at $1.80 to $1.85.

Chicago, by Telegraph.—The Wire Nail manufacturers held a meeting in Cleveland last Thursday and advanced prices to $1.55, Cleveland and Pittsburgh. Reports made at the meeting showed an aggregate stock of only 100,000 kegs with contracts booked for over 400,000 and a good demand still coming in from large buyers. Conditions have seldom been so strongly in favor of the manufacturers. The advance made was very conservative under the circumstances. Reduced freight rates make the factory price equal to $1.67, Chicago, or only 3 cents advance. Another advance, however, is probable in the near future. Jobbers met on Monday and raised their prices to $1.75 for small lots and $1.70 for carloads. Those who persistently parted with their stock at very low prices, in competition with the manufacturers, now see the mistake they made.

Barb Wire.—The demand for Barb Wire continues good, and while there is no quotable change in prices a hardening tendency is noticed. We quote $2.45 @ $2 50 for Four Point Galvanized, in carload lots at mill. In New York the price is $2.65 @ $2.70 for carload lots on dock, and $2.70 @ $2.75 at store.

Chicago, by Telegraph.—Barb Wire is in much stronger demand as the spring opens, and manufacturers expect shortly to have more business than they can well handle. Inquiries are coming in from all sections. Factory quotations are unchanged at $2.20 for painted and $2.60 galvanized, but it will not take much of an addition to the demand to push prices up. Jobbers quote small lots from stock at $2.30 and $2.70 respectively.

Rope.—During the past few days the floor market has shown exceptional weakness. This is especially the case with Sisal, and, though it has had as yet no appreciable effect on manufactured goods, it is thought that it may have very soon. New Zealand is of course in sympathy with Sisal, and should a decline in the latter be maintained New Zealand must follow. Quotations on Rope have so far been well maintained, and we have no change to note at the present writing.

Screws.—There are indications of a disposition on the part of some manufacturers of Wood Screws to be aggressive in seeking new customers, to whom they are offering unusual terms. This has caused a weakness in prices, and quotations are being made in some cases which are lower than any during the past few months.

Dickson Transom Lifters and Openers.—These goods, a description of which appeared in our issue March 30, are put on the market by the G. J. Dickson Mfg. Company, Albany, N. Y., W. H. Eckert, 18 Warren street, New York, agent. The self-locking Transom Opener is sold at the following list, subject to a discount of 30 per cent.:

Bronzed Iron.

Diameter of rod.	Length of rod.	Length of arm.	Price each.	For extra length of rod per foot.	For extra length of arm per foot.
Inch.	Feet.	Feet.		Cents.	Cents.
⅜	2	1	$2.00	20	15
½	3	2	2.75	30	20
⅝	3	2	3.50	40	20

Nickel, brass, bronze and ebony plated, 70 per cent. more than bronzed iron.

Solid Bronze, Highly Polished.

Diameter of rod.	Length of rod.	Length of arm.	Price each.	For extra length of rod per foot.	For extra length of arm per foot.
Inch.	Feet.	Feet.		Cents.	Cents.
⅜	2	1	$5.00	55	40
½	3	2	6.50	75	55
⅝	3	2	8.00	$1.00	55

Solid brass, same price as bronze.
Old copper, antique bronze and antique brass, 20 per cent. more than bronze.
Oxidized silver, 50 per cent. more than bronze.

The Champion and Premier Transom Lifters, the Dickson Casement Adjuster and Springs for Transom Lifters are sold at a discount of 60 per cent. from the following lists:

Champion Transom Lifter.

Length.*	Diameter.	Bronzed iron. Price each	Bronzed iron. Extra length.	Nickel plated. Price each.	Nickel plated. Extra length.
Feet.	Inch				
3	¼	$0.60	10 cents a foot.	$2.30	30 cents a foot.
4	¼	.70		2.60	
5	¼	.80		2.90	
3	5-16	.95		2 85	
4	5-16	1.10	15 cents a foot.	3.30	45 cents a foot.
5	5-16	1.25		3.75	
6	5-16	1.40		4.20	
4	⅜	1.30		3.90	
5	⅜	1.50	20 cents a foot.	4.50	60 cents a foot.
6	⅜	1.70		5.10	
7	⅜	1.90		5.70	
8	⅜	2.10		6.30	
6	½	2 55	30 cents a foot.	7.65	90 cents a foot.
7	½	2.85		8.55	
8	½	3.15		9.45	

Solid Bronze Lifters, Highly Polished.

Length.*	Diameter.	Price each.	Extra length.
Feet.	Inch.		
3	¼	$3 00	40 cents a foot.
4	¼	3.40	
5	¼	3.80	
3	5-16	3.80	
4	5-16	4.40	60 cents a foot.
5	5-16	5.00	
6	5-16	5.60	
4	⅜	5.20	
5	⅜	6.00	80 cents a foot.
6	⅜	6.80	
7	⅜	7.60	
8	⅜	8.40	
6	½	10.20	
7	½	11.40	$1.20 a foot.
8	½	12.60	

* Combined length of lifting rod and arm.
Bronze plated, brass plated and ebony plated, same price as nickel plated.
Solid brass, same price as solid bronze.
Antique bronze or brass and old copper, 10 per cent. more than solid bronze.
Oxidized silver, 25 per cent. more than solid Bronze.

Premier Transom Lifter.

*Length.	Diameter.	Nickel plated. Price each.	Nickel plated. Extra length.	Solid bronze. Price each.	Solid bronze. Extra length.
Feet.	Inch.				
3	5-16	$4.35	45 cents a foot.	$5.30	60 cents a foot.
4	5-16	4 80		5.90	
5	5-16	5.25		6.50	
6	5-16	5.70		7.10	
4	⅜	5.40	60 cents a foot.	6.70	80 cents a foot.
5	⅜	6.00		7.50	
6	⅜	6.60		8.30	
7	⅜	7 20		9 10	
8	⅜	7.80		9 90	
6	½	9.15	90 cents a foot.	11.70	$1.20 a foot.
7	½	10.05		12 90	
8	½	10.95		14.10	

* Combined length of lifting rod and arm.
Bronze plated, brass plated and ebony plated, same price as nickel plated.
Solid brass, same price as solid bronze.
Antique bronze or brass and old copper, 10 per cent. more than solid bronze.
Oxidized silver, 25 per cent. more than solid bronze.

The Dickson Casement Adjuster.

Finish.	Diameter.	Length.	Price each.	For extra length, per inch.
	Inch.	Inches.		
Bronzed iron..	5-16	10	$0.60	$0.05
	⅜	10	.75	.06
	½	10	1 00	.08
Nickel plate..	5-16	10	1 00	.08
	⅜	10	1.20	.10
	½	10	1.60	.14
Solid Bronze..	5-16	10	1.30	.11
	⅜	10	1 60	.14
	½	10	2.25	.20

Springs for Transom Lifters.

Size of rod.	Bronzed.	Plated, any finish.
	Each.	Each.
¼	$0 12	$0.24
5-16	.15	.30
⅜	.18	.36
½	.20	.40

Discount Sheet.—The Barnes Mfg. Company, Phœnix, N. Y., issue the following discount sheet, which applies to their 1893 catalogue and price-list. Terms, 30 days, f.o.b. factory:

	Discount. Per cent.
Phœnix Vises: All styles and sizes, including Case Assortments, Sample Blocks and Combination Pipe Jaws	33⅓
Pipe Vises	33⅓
Reinforced Bronze Metal Sash Chain	60&10
Reinforced Steel Sash Chain, either bright or copper finish	60&10&10
Victor Bronze Sash Chain	65
Victor Steel Sash Chain, either bright or copper finish	65&10
Sash Chain Fixtures	60
Plumbers' Chains—12 yard boxes or 500 feet reels	New List 60
Basin, Wash Tray and Bathtub Chains	New List 60
Brass Split Links	New List 60
Brass Eight Hooks	New List 60
Lathe Dogs and Lathe Dog Wrench	50&10
Steel Machinists' Clamps	33⅓
Door Springs	33⅓
Door Stop and Holder	33⅓
Door Checks	33⅓
Barrel Trucks	40
Bench Anvils	50
Christmas Tree Holders	50
No. 1 Carpet Stretchers	40
Cork Presser	40
Mail Box No. 1, with or without locks	33⅓
File Cards	33⅓
No. O Tack Hammers	40
Window Cleaners	40
Floor Scrubbers	50
Locking Chains	33⅓
Dog Leaders	40
Key Chains	40

The company issue under date March 9 a revised price-list of their Phœnix Plumbers' and Sash Chain.

Bright Wire Goods.—Prices in this line are irregular and competition is very sharp, resulting in lower quotations than have ever before been made.

Augers and Bits.—While manufacturers seem to be adhering strictly to their prices for Augers and Bits, many of the leading jobbers of the country show a disposition to undersell the manufacturers, and are quoting prices lower than the makers will sell at.

Shedder, Mane Comb and Sweat Scraper.—This article, which is manufactured by F. E. Kohler & Co., Canton, Ohio, and was described in last week's issue, is sold to the trade at $1.50 per dozen and $15 per gross.

Monarch Trouser Guard.—A description of this article appeared in a recent issue. The Guard is put on the market by the Monarch Cycle Company, 42–52 North Halsted street, Chicago. It is sold to the trade at 75 cents per dozen.

Glass.—The local demand for Glass has shown no increase since our report last week, and while there is a moderate amount of Glass being sold, trade is far from being considered good. Factories continue to report no accumulation of desirable sizes in stock, with an increasing demand for their output. The capacity for producing American Glass at the present time is said to be the largest in the history of the Glass business in this country, the capacity now being equivalent to 1712 pots. Indications point to an increase in this number for next season. As this increase will largely arise from established concerns enlarging their plants, it would appear that makers familiar with the Glass business considered the outlook favorable for such extensions. Prices of American Glass remain unchanged as quoted. A committee from the National Window Glass Company held a conference on April 4 at Philadelphia with the New Jersey Glass manufacturers, with a view to getting them in the association, and the committee were expected to meet the New York importers of Glass in this city on the day following to come to some similar agreement with them. The New York French Window Glass Association agreed upon an advance in prices, to take effect April 3. The discount now in force is 75 and 10 and 5 per cent. from the French list. While no official announcement has been made as to the plan adopted by which it is hoped to sustain prices, it is understood that a sum has been paid by each firm to the association which will be considered forfeited should prices be cut by any concern. The Plate Glass trade remains unchanged, the price and demand being satisfactory. The outlook for all branches of the Glass business is considered by those in the trade as encouraging, and the demand is expected to increase in the near future. We quote prices as follows: American Window Glass, 2000 boxes at one time, 80 and 10 and 10 per cent. discount; carloads, 400 boxes, 80 and 15 per cent. discount; less quantities than carloads, 80 and 10 per cent. discount. Freight allowed on car lots and

over, not to exceed 17½ cents per 100 pounds; less than car lots, f.o.b. at shipping point. French Window Glass, 75 and 10 and 5 per cent. discount. American Plate ranges in price from 60 and 2½ per cent. discount to 60 and 5 per cent. discount. Imported Plate Glass, 60 per cent. discount to 60 and 10 and 5 per cent. discount.

Export Notes.

SIR RODERICK W. CAMERON of the well known Australian shipping firm R. W. Cameron & Co., 21 South William street, in this city, expects to leave Adelaide, South Australia, April 12, on the Peninsular and Oriental steamer "Oceana" for London, via the Suez Canal. It will be remembered that Sir Roderick and W. H. Douglas of Arkell & Douglas, who arrived back February 25, were fellow voyagers from San Francisco early in October last.

Mexican banks have recently pressed borrowers, resulting in several large failures of a speculative nature, although bank managers state that the mercantile community generally is entirely solvent. The great premium on foreign exchange caused by the depreciation of silver has resulted in diminishing importations of goods from Europe, whence is drawn the greater portion of such merchandise as competes with native manufactures, including cotton textiles and paper. In this way the Government finds the customs collections affected by what is in point of fact a decrease in tariff never contemplated when the tariff was last revised.

Some conception of the traffic carried on in refrigerated meat between New Zealand and Great Britain may be gathered from the following figures: For the last half of 1892, 32,180,583 pounds of mutton, 687,002 pounds of lamb, and 890,134 pounds of beef were shipped for this trade. For the whole of 1892 the figures are: Mutton, 80,585,750 pounds; lamb, 10,975,799 pounds, and beef, 6,075,008 pounds. In 1891 the export from the colonies was still larger, amounting to 86,282,935 pounds of mutton, 12,068,308 pounds of lamb, and 11,847,839 pounds of beef.

The foreign trade returns of the Argentine Republic for the last year show merchandise imports valued at, gold, $91,400,000, and exports at $112,700,000. Compared with the previous year this is an increase of 36 per cent. in imports and 13 per cent. in exports. The customs revenue amounted to, gold, $92,200,000, an increase of 75 per cent. over 1891. The total trade with the United States amounted to $12,200,000, against $7,600,000 in 1891; with Great Britain, to $55.000,000, against $45,100,000.

The State Department at Washington is advised that the Prefect of Ting, Chiang and Laig, adjoining the island of Amoy, China, has issued a proclamation prohibiting the sale or use of kerosene oil by his subjects. As the trade in this oil is almost wholly American, Dr. Bedloe, United States Consul at Amoy, protested vigorously against the proclamation on the ground that it violated treaty rights, and demanded its withdrawal.

Crop reports received by the Government of the Argentine Republic show that while drought prevails in some districts, the general condition of the wheat crop is excellent.

In connection with the proposed improvement of the Mexican Navy the establishment of a Government dockyard is being considered. An officer detailed several months ago to make a survey of the Pacific Coast for a location has visited Mazatlan, Acapulco and other points, including Guaymas. In his official report it is said he will recommend the latter port.

United States Minister Ryan, in Mexico, supplementing his dispatch of March 15, gives the following details of the decree of the Mexican Government admitting certain cereals into Mexico duty free: From March 15, 1893, corn (in grain and in flour) and beans, imported through the maritime and frontier custom houses of the Republic, shall be exempt from the payment of import duties under conditions and terms identical with those of the decree of June 18, 1892, which was issued because of the failure of the cereal crop and consequent advance in breadstuffs.

Recent advices from the City of Mexico call attention to a coal famine at Mazatlan, the principal port of Mexico on the Pacific Coast. It is stated that many manufacturers have been compelled to shut down for lack of fuel.

U. D. Eddy, vice-president of the Coombs, Crosby & Eddy Company, who went to Chicago early in March to make final arrangements for the inauguration of a headquarters where their foreign clients visiting the Exposition could be entertained and directed, was taken seriously ill on his arrival. Erysipelas developed, confining him to his room for three weeks, until late in March, when C. A. Coombs of the same company went to Chicago for the purpose of accompanying him back to New York, where they arrived late last week.

Obituary.

N. H. VAN WINKLE.

N. H. Van Winkle, while at dinner Friday evening, March 17th, was suddenly stricken with apoplexy, resulting fatally the next day. Two years ago he had a slight attack of paralysis which affected his right side, but was not considered very serious, although he laid aside his business and made a trip to Europe, remaining, however, but about four weeks. In January, 1884, he formed a copartnership with William H. Miller under the firm name of Miller & Van Winkle, for the manufacture of Steel Wire and Steel Springs, their factory being at the corner of Bridge and John streets, Brooklyn. Mr. Van Winkle was known among his business associates as a genial gentleman of sterling worth, and he will be much missed. He leaves two sons, both grown, his wife having died 18 months ago. His funeral was conducted by Eastern Star Lodge 227 of Brooklyn, of which he was a member. The business will go on uninterruptedly under the same firm name.

GEORGE L. HOWELL.

George L. Howell, a Hardware merchant of Dixon, Ill., died on March 23, in the seventy-third year of his age. Mr. Howell was born in Tully, Onondaga County, N. Y., August 24, 1820. Mr. Howell removed to Illinois and settled in Dixon in 1853. The following year he formed a copartnership with P. M. Alexander in the Hardware business, which was continued up to Mr. Howell's decease. For a long time Mr. Howell has been a patient sufferer, first with rheumatism, then with slowly developing consumption, which finally carried him to the grave.

Trade Items.

THE WILLER MFG. COMPANY of Milwaukee, Wis., are well known in the Hardware and building trades for the Sliding Blinds, Folding Blinds, Venetian Blinds, Window Screens, and Screen Doors that they manufacture. So widely are these goods known that the name "Willer" has a special value in this line of trade. The company are now suffering from some of the effects of building up a good name and a wide reputation. Unauthorized Canadian manufacturers have appropriated the same name and advertise that they are manufacturers of the Willer goods, which they offer in competition with the American article. Upon a thorough investigation of the subject it has been found that the Willer Mfg. Company have no legal redress. The Canadian patent laws are such that the American manufacturer is powerless. His patent rights, designs and trade-marks can be stolen indiscriminately by the Canadians. This may be new to many American manufacturers and may lead them to inquire as to what extent their productions are appropriated, and thus bring about some remedy through governmental intervention. It is exceedingly vexatious to find not only one's ideas but even his name stolen.

THE LANGSTAFF HARDWARE COMPANY, Memphis, Tenn., gave a dinner to their employees on the 11th ult. in recognition of their faithful attention to duties and as an evidence of the company's appreciation. It was well attended and highly successful, and doubtless served to increase the good feeling which already exists between the company and their employees.

THE LARGE ESTABLISHMENT of Phillips & Co., Niagara Falls, N. Y., was recently damaged by fire, which started among the oil cans situated in the back of the store. Here the fire was, however, confined, and the front of the store was damaged only by smoke. Although much inflammable material was in the building, the fire was quickly subdued, the employees having had presence of mind to shut up the doors, thus diminishing draft and helping to smother the flames. The loss as adjusted by the insurance companies was $2265. Referring to the matter of insurance, the firm make the following remarks, which will probably be of interest to the trade: "The insurance adjusters acted very fairly. We came together in a very short time on all the different points as to damaged goods. So far as the goods reported lost were concerned, no question whatever was made either as to quantity or value. The most damage, of course, was from goods on hand damaged by water. This, of course, does not agree with the general statement of people having losses to adjust with insurance companies; but we are inclined to think that if people understood their business and knew what their stock was worth, and asked only a fair price upon the valuation of damages, they would have no trouble with the majority of insurance adjusters. One thing which we

found the insurance men appreciated was the fact that a lot of this stock which we thought might deteriorate by standing in a wet condition was taken down by us within half an hour after the fire took place, the wet paper torn off and the goods rubbed up and wrapped in new paper. This applied to a great many of the goods. After one of the adjusters had been here and looked over the stock, he said that we might go ahead and clear it up. By the time all the adjusters got here the damaged goods had been got out, the dirt cleared away, and they were thus enabled to get at the amount of value of the different goods very rapidly. One of them spoke of this, and seemed to appreciate it; and we are inclined to think that if people would take more pains in this respect there would be less fault found with the insurance people. This is the fourth loss we have had inside of eight years. The first loss, eight years ago, was $4500, the others being minor losses. We must say that we have always found the insurance people perfectly willing to give us everything that was fair."

A. N. STEIN HARDWARE COMPANY, 35 Warren street, New York, have been appointed agents for the sale of the Solid Steel Spiders and Griddles, manufactured by the Cleveland Stamping & Tool Company of Cleveland, Ohio.

THE PARTNERSHIP heretofore existing under the name of Kimball & Dunbar, dealers in Hardware, &c., Oneida, N. Y., has been dissolved by mutual consent, the interest having been sold out to Seth Dunbar of Baldwinsville. Mr. Kimball is authorized to settle all the affairs of the late firm. He will also act as manager for the purchaser in the new firm.

THE INDIANA BICYCLE COMPANY, Indianapolis, Ind., in their advertisement on another page of this issue, illustrate the Waverly, which they are putting on the market. It is referred to as a strictly high grade machine.

THE GUN STORE of Hartley & Graham, 313 and 315 Broadway, New York, was recently the scene of a sad tragedy. At about half past five o'clock on March 29, William W. Reynolds, who for 30 years has managed the export department of this firm, shot and killed Miles V. Kelly, head bookkeeper of the house. Then turning the pistol against himself, he inflicted a wound from which he died about midnight of the same day. No cause has been assigned for the act other than the insane freak of a man whose mind had become unbalanced by the illness of his mother. Some queer actions had been observed by relatives and others for some time past, but nothing that would indicate the man was crazy. The revolver with which the shooting was done had evidently been taken from stock during the day, as the tag was still attached to it. Mr. Reynolds was the oldest employee of the house and about 50 years old. He leaves a wife, but no children. Mr. Kelly had a wife and one son. An incident in Mr. Reynold's history may not be out of place here. During the Franco-Prussian war Mr. Reynolds was in Paris in the interest of what was then Schuyler, Hartley & Graham for the purpose of securing further contracts for arms and ammunition, this firm having already supplied the French Government with much war material. The contracts, accompanied by drafts to pay for same, had been obtained, and as Paris was in a state of siege there was no regular way of getting out. In this emergency Mr. Reynolds constructed a balloon to get away in. Gambetta, who was also desirous of leaving, was so pleased with it that it was presented to him, he leaving immediately, while Mr. Reynolds set about having another made. In about ten days the second was ready, and, accompanied by Charles P. May, also identified with Schuyler, Hartley & Graham, they succeeded in leaving Paris, landing safely at Amiens, about 60 miles north of the capital.

THE QUARTERLY ISSUE of the desk calendar of the Nubian Iron Enamel Company, Cragin, Ill., comes to hand, with the following sprightly introductory note by manager Chas. E. Bonnell: "When we last came to you with our New Year's Salutatory we were in the flush and heydey of the new year. '92 had been especially gracious, but since, we have been in sack-cloth and ashes, with the accent on *ashes;* we presume for appearance sake we should write in a lugubrious tone of voice, but we are naturally a sprightly and vivacious young thing; with a superabundance of animal spirits and we can't look blue; besides, the outfit was too small for us anyhow, and—well on the quiet, we were fully insured, but that, of course, is not the reason for our broad smiles and good appetite—it is because the 'still, small voice' whispers: 'Well done, good and faithful, &c.' you make *the best blacks on earth*, and that means—well, here's to you for the next three months." It evidently takes a good deal more than a mere fire to check the enterprise of this company.

J. C. GARRETT has retired from the old established Hardware business at 59 Haverhill street, Boston, Mass., and will be succeeded by his son, Edwin E. Garrett.

AMONG THE ATTRACTIVE PUBLICATIONS for the present season is one issued by the Pope Mfg. Company, Boston, entitled "Out-Doors," a book of healthful pleasure. The work contains 77 pages, liberally illustrated, with articles on different sports by recognized authorities. Both covers are illustrated in colors representing some of the popular out-of-door recreations. The topics treated are Lawn Tennis, Yachting, Terrestrial Flight—Bicycling—Football, Baseball, Horsemanship, Health and Rowing, Recreation and Sport in Canoes. The advertising is all confined to a few pages at the back of the book.

TROY NICKEL WORKS, Troy, N. Y., have appointed Francis Frost & Co., Toronto, Ont., as Canadian agents for the sale of their Alaska Stove Trimmings.

THE BIDDLE PURCHASING AGENCY of Philadelphia, New York, Pittsburgh and Chicago, have been succeeded by a corporation, and in the future will trade under the name of the Biddle Purchasing Company. W. C. Biddle is president of the new concern and Clement M. Biddle, secretary and treasurer.

IN THEIR PAGE ADVERTISEMENT appearing elsewhere in this issue, Brittan, Graham & Mathes, Pittsburgh, Pa., direct the attention of the trade to their Front Door Sets. Announcement is made that these Sets are made either plain or ornamental, and that flat Steel Keys for night work are furnished. The low prices at which these Sets are furnished is also emphasized.

Louisville.

(From a Special Correspondent)

THE HARDWARE TRADE continues remarkably good in most lines. Some merchants report quiet business, but others are rushed as much as ever, it depending on the class of goods carried and pushed by the different dealers. Besides the regular seasonable goods, Heavy Hardware, Contractors' Supplies, Agricultural Implements, &c., there is a vast amount of summer goods going out. Long before the flies and other pests are hatched the wise householders are preparing to prevent their ingress, and the retail dealers are making displays of Screen Doors and Windows of all styles. Weather conditions continue favorable for all out-door work, both agricultural and structural. Many improvements are contemplated this year that have lain dormant for several seasons, as the general promises of prosperous times ahead are flattering notwithstanding certain financial upheavels in several localities through the South among the banks, but as in this city last year only home localities are affected, and renewed strength seems to follow instead of weakness and hesitancy.

In consequence of a good building season in view, all material entering into construction is being handled in large quantities. Lumber is in excellent demand, and the saw mills are all busy. The railroads and car manufacturing companies are heavy purchasers of all the desirable timber they can procure, as car construction will be liberally carried on this year. Except in a few temporary advances in staple goods like Nails and and Fence Wire, there is nothing to portend higher rates, but, on the contrary, it will be proved that low prices and close margins will remain with us indefinitely, perhaps.

There is no objection to low prices, and competition will keep close profits in vogue, and so the dealers and manufacturers will get on as well as ever, providing the former are able to keep collections up close. But just there is the one point of danger. Goods are sold on too long time, too much risk for small profits. The jobbers are selling on a narrow enough margin to warrant them in demanding cash inside of 30 days, and if they got such returns sailing would be smooth enough.

Local Advertising.

THERE IS A GREAT DIFFERENCE of opinion among retail Hardware merchants as to the most effective method of advertising their business. It is a recognized fact that bright, judicious newspaper advertising produces good results, while dodgers or gutter snipes are considered by many to be worthless as an advertising medium. Regular customers need to be frequently reminded that they can purchase goods to better advantage where they are in the habit of trading than at some other store where they may happen to drop in. Live merchants stimulate trade at dull seasons of the year by offering special inducements in certain lines. The stereotyped form of notice attracts little if any attention in these stirring times, and something striking, which will instantly rivet attention, must take its place. The manner in which this was done in one case may be suggestive to some of our readers. A firm in a Western city prepared themselves for a large business in tools by providing sufficient stock in this line to meet all demands, and then sent the following postal card by mail to mechanics whose names were selected from the city directory:

WE HAVE BEEN ACCUSED

Of maintaining the Best and Cheapest place in the City whereat to buy

HARDWARE.

We are now making a Special Sale of PLANES, SAWS, CHISELS, AUGER BITS, BRACES, SQUARES, HAMMERS, HATCHETS and Everything in the TOOL line at Reduced Prices, for Thirty Days. Call and see us.

CASE & UEHREN,

TERMS CASH. 29 River Street.

We are advised that the results were entirely satisfactory, a good many inquiries having been stimulated and a demand created for those goods. We shall be glad to hear from others on this subject.

Exhibit of Callahan & Douglas.

CALLAHAN & DOUGLAS, Binghamton, N. Y., made an exhibit of goods in their line at the Industrial Fair held last fall in their city, a portion of which is shown in Fig. 763. The display board reached from the ceiling of the exhibition building to within about 3½ feet of the floor, and filled the entire width of the space at the back. A star of chain was the central figure, within which small tools were artistically arranged. Tools of larger size were grouped with good effect on the board outside the star, showing lines of the various articles. On the floor directly

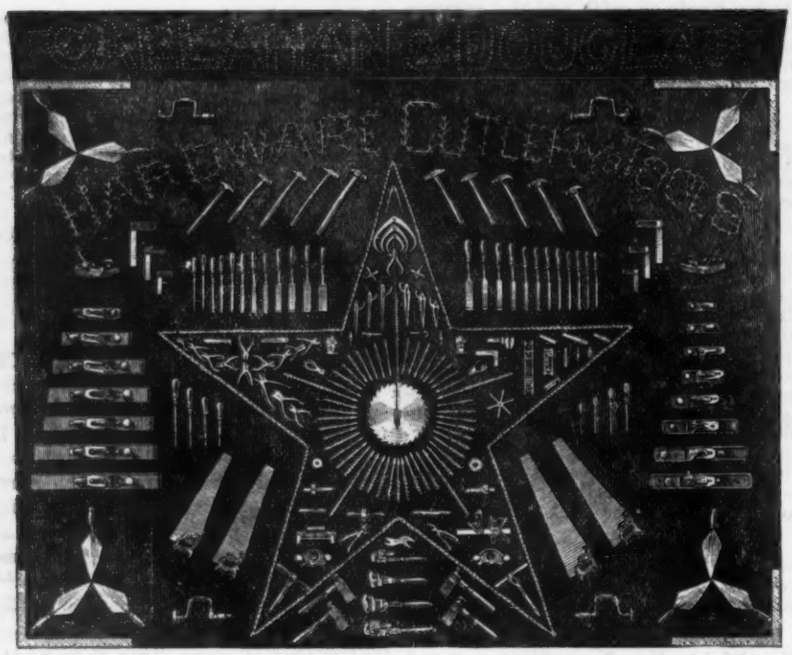


Fig. 763.—Exhibit of Callahan & Douglas.

in front of the star was a square formed of gallon cans of mixed paints, in the center of which was a table. Fancy coffee and tea pots were shown on the table. The other goods exhibited in their space consisted of lawn mowers, carpet sweepers, wringers, granite ware, fine builders' Hardware, &c.

Tanks for the Manufacture of Window Glass.

THE CHANGE which is being made from pots and furnaces to tanks in Window Glass factories, is a matter in which Hardware merchants who handle Glass are interested. This movement on the part of manufacturers is not to be attributed to philanthropy, but to the necessity of cheapening their output, and of placing themselves on an equal footing with competitors. Tanks are of various sizes, but an idea as to the relative capacity of tanks and pots may be gained from the statement that the Western district has eight tanks with a capacity equal to 350 pots, and the Eastern district two tanks equal to 78 pots. In the first case one tank has about the capacity of 44 pots, and in the second case the capacity of 39 pots. A Findlay, Ohio, daily paper gives an account of a tank costing $18,000, which has been recently finished in one of the window glass factories in that city, and states its advantages over pots. The tank is 75 x 14 x 5 feet and holds 400 tons of Glass. It is fed continually, and the Glass becomes gradually melted and purified while passing from one end to the other. Twenty-four blowers will be employed during the present fire, and arrangements have been made to increase the tank to a size sufficient to accommodate 30 blowers next year if desired, which is very probable. The advantages claimed for the tank are economy of fuel, economy of labor, improved quality of product, ease on the blowers and a saving of the cost of pots, rendering the production cheaper and the profits correspondingly greater. As to economy of fuel, the proprietors claim a saving of a large per cent. In the tank there are used 32 ¾ inch burners, while the ten pot furnace has 16 ¾-inch openings. Again, the open space or space from the level of the Glass to the roof of the tank is one-half less than in a ten-pot furnace. It is easier on the men because they have their Glass nearly on a level with themselves and are not compelled to stoop, and the factory is much cooler. This factory used a ten and eight pot furnace last year, but with the increased capacity afforded by the tank and other corresponding improvements their output will be increased one-third, and will necessitate the employment of six more blowers and 50 more hands.

Sporting Goods Department.

BELCHER & LOOMIS, 89 and 91 Weybosset street, Providence, R. I., in connection with their large and varied stock of Hardware, find it profitable to give prominence to Sporting Goods. In this department are found Tennis Goods, Fishing Rods, Reels, Tackle, &c., Baseball and Athletic Goods, Revolvers, Traveling Toilet Sets, &c.

A rack for the display of Split Bamboo Fishing Rods in one of the large show windows is made by standing four shellaced sticks in a line, and fastening them to the floor with angle irons. The uprights are about 1½ inches square, 4 feet high. They are placed so as to occupy 8 feet space in length, having on the front side of each stick a number of square screw hooks from the top to the bottom, to support horizontally as many Rods as desired. The rack displays the Rods to advantage and keeps them straight, as they are supported at four equally distant points. About the floor of the window Reels are placed and other Fishing Tackle, also Baseballs in pyramids, Gloves, Masks, Bats, Tennis Goods, &c.

In this window they also have an upright glass case about 4 feet high, 6 feet long and 2 feet wide, backed with mirrored doors. In this are displayed Pistols on an upright rack, and a line of leather goods, such as Traveling Toilet Sets, Shaving Cases and similar goods. Near the window, in front of the counter, is a stand, as shown in Fig. 764, from which Ball

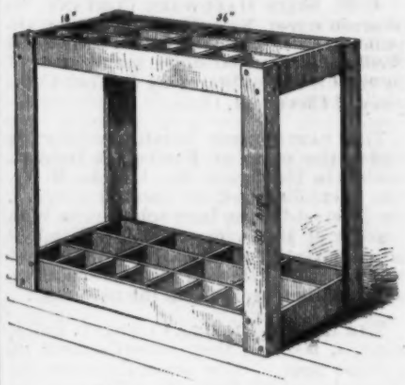


Fig. 764.—Rack for Ball Bats.

Bats are retailed. The partitions afford an opportunity of keeping the different styles separate, yet allow them to be easily examined and handled.

Tennis Rackets and Baseball Goods are retailed from a large counter showcase, while near at hand is a dumb waiter to the second floor, where the wholesale stock is kept, with a stock clerk in attendance to answer the call of an electric bell.

Tact in Selling.

IN AN ARTICLE containing hints on selling, *Ironmongery* of London gives the following advice to Hardware salesmen, which may be perused with profit: "It is very bad management to seek to force your opinions on a customer, such as, for instance, trying to get him to take Brown's make of Brushes when he explicitly asks for Smith's; or telling him that Jones' patent Ventilators are defective in principle when he asks for them, simply because what you happen to have in stock are of another make. Most people are inclined to suspect you are not acting honorably with them if you should seem to press them to take a different article to what they inquired for; much better is it to tell them candidly you do not stock Brown's brushes or Jones' Ventilator, but will procure them specially, at the same time showing what you do keep, without appearing to push them. But when a person does not specifically ask for a certain make of goods, you may unobtrusively influence him to take that of which you have a large stock, or which, for some other good reason, you would rather sell. It is much more satisfactory, both to your employer and your customer, that where you find you can use your influence over the latter you ought to get him to take a good reliable article

rather than one of the description popularly known as "cheap and nasty." Many a purchaser will actually seek the advice or opinion of the assistant who is serving him as to the merits of the article he is buying, and rests quite satisfied with the answer. It has often occurred to me that to correctly reply to all the questions asked by those who patronize an ironmonger's shop an assistant must needs be a walking encyclopædia. How to fix a Gas Pipe or an Electric Bell, how to replace an old Sash Line with a new one, how to clean a Silver Teapot or a rusty Range, the best way to use a Plane or an Axe, a Digging Spade or Garden Shears; the most appropriate color of Tile to suit this Grate, or the most suitable Knocker for that door; these and many others are repeatedly asked, and the assistant who fails at any of them is placed rather awkwardly, as the customer is likely to lose faith in his ability if he betrays his ignorance of the matter under consideration. It were much better for an assistant to remain silent rather than talk on a subject in which he is not sufficiently informed, for it is not unlikely that the customer may be thoroughly conversant with it, and an attempt on the part of the former to describe that of which he is ignorant can only result in the latter setting him down for an ignoramus all round.

Sheet-Iron Nail Pouches.

WE ARE indebted to H. S. Smith of Miller, Smith & Co., Chadwick, Ill., for a sketch and description of the Nail Pouches shown in Fig. 765. The Pouches are made of sheet iron 16 inches high, 16 inches deep and 10 inches wide, having a capacity of a little more than 100 pounds of Nails. They are so arranged that they are self-closing, and Nails can be taken from either side of the counter, or the Pouches can be used under the ledge. The point is made that the Pouches can easily be taken out, cleaned and filled and then be replaced; also that room is economized, as nearly the full hight of the counter is utilized for Nails, thus dispensing with wide bins. In using the old style of Nail bins the company experienced inconvenience from Nails becoming mixed in weighing and putting them back in the bins. This difficulty, they state, is entirely obviated by the use of the Pouches. Mr. Smith is prepared to name prices to any one desiring Pouches or Counters, as they can be put in any counter or under ledge at a limited expense.

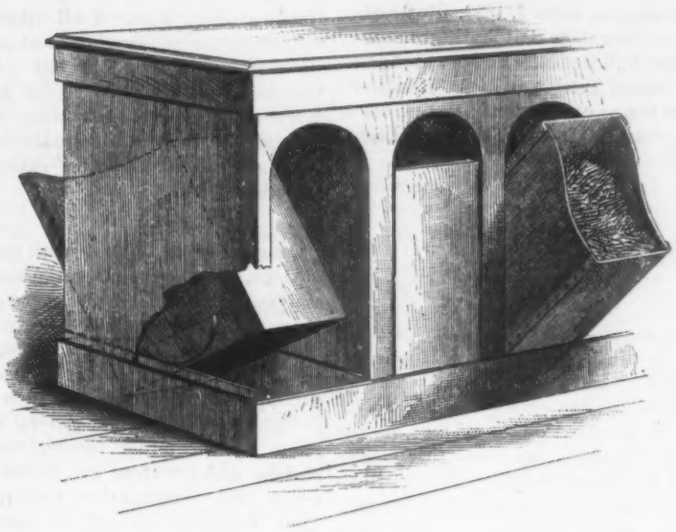


Fig. 765.—Sheet-Iron Nail Pouches.

Manufacturing.

THE SALEM WIRE NAIL COMPANY of Salem, Ohio, did an unprecedented business in the month of March. They shipped 110,000 kegs, of which they made 90,000 kegs during the month. These figures cover nothing but Nails The claim is made by the company that both their shipments and production in March are in excess of similar business done by any other Nail works in the world. The quantities given are certainly enormous for a single company.

Norton Emery Wheel Company, Worcester, Mass., have been allotted a space 37 x 10 at the World's Columbian Fair. The exhibit will be open on three sides, and will include various sizes and shapes of Emery Wheels and numerous Emery grinding machines in operation.

The Inland White Lead Company, 149 and 151 Huron street, Chicago, have recently begun manufacturing operations outside of the combination. They will sell pure White Lead, White Primers and Putty in small lots to the Hardware and drug trade. Thos. S. Vaughan is president, and Benj. F. Hadduck is vice-president and treasurer.

Eugene Munsell & Co., 218 Water street, New York, are increasing their facilities for manufacturing Micanite. It will be remembered this is a production for insulating purposes that is being largely used by electrical companies. By improved processes of manufacture waste mica, heretofore almost valueless, is being made into an endless number of forms and shapes, sheets that can be cut to size included. We are advised that orders are coming in very freely, and, while so far they have managed to execute them with reasonable promptness, they are being pushed to keep pace with the demand. Electricians have experimented with almost everything for this purpose, but have fallen back on mica, which for many uses has heretofore been unavailable on account of great cost.

The Peck, Stow & Wilcox Company have commenced the manufacture of a line of Gas and Burner Pliers. These goods are referred to by the company as drop forged, solid steel, well tempered and polished, and fully warranted. The Burner Plier is made in 5, 6 and 7 inch sizes, the first two having one opening and the latter two sizes of grip. The Gas Pliers are made in seven sizes, 7 to 14 inches inclusive, with two sizes of openings and screw driver attachment on one arm. Both classes of Pliers have the usual grip for small work on the end.

The Dubuque White Enameling Works at Dubuque, Iowa, whose plant has been in course of erection for some months, turned out their first product on the 27th ult. It was pronounced of very high quality by those who had the privilege of examining it.

Butts & Ordway, 500 Atlantic avenue, Boston, Mass., manufacturers of the well-known "B. & O.," specialties, which include the Sure Grip Adjustable Jaw Foot Vise and the Sure Grip Tire Upsetter, report a growing demand for these tools, and advise us that they are now prepared to fill orders promptly. "B. & O." Solid Wrought Iron Anvils, warranted and of best English make, have recently been added to their line. These Anvils will be replaced if found defective.

The Clifton Springs Mfg. Company, Clifton Springs, N. Y., are manufacturing an extensive line of Evan's anti-rusting Tinware and other Tinware specialties. Among these are included Pails, Sprinkling Pots, Dish Pans, Tea Kettles, Foot Baths, Toilet Sets, Chamber Pails, Commodes, Wash Boilers, Dippers, Cups, &c. They also make the Harland and Angle Faucet Oil Cans; Mrs. Van Deusen Cake Molds, Coffee Pots and Dinner Pails.

H. H. Harvey, Augusta, Maine, has decided to rebuild his Hammer and Tool works, which were recently destroyed by fire. The forge shop has already been commenced and frames for the other buildings will be placed at once, so that the work may be continued until the entire set of buildings are completed. The plant will include the engine, boiler and coal rooms, of brick, which were left standing. There will be erected one two-story building 55 x 45 feet, to be used on the first floor for steel, iron and pattern rooms, &c. The second floor will be used for an iron machine shop, together with wood-working and turning shop. This will be supplied with the most improved machinery for the manufacture of Stone-jacks, Derricks, &c., and for a general jobbing business. There will also be a forge and hammer shop, one-story high with monitor roof nearly the entire size of the building, which will be 60 x 41 feet. This building will contain about 25 furnaces and forges, together with steam hammers, presses, Bradley and other trip-hammers. The shop will have a capacity of forging 2 tons of hammers and 2 tons of granite tools per day, besides chains, bars, picks and ironwork for derricks, winches, stone-jacks, &c. There will also be built one two-story building 103 x 30 feet, the first floor to be used for grinding and polishing rooms, office, tool and store rooms, &c., &c. The second story of this building will be used for the manufacture of bush hammers and other fine tools connected with the granite, marble and brownstone trades, together with mason, blacksmith, grist-mill, railroad and prospectors' hammers and tools. A large portion of this floor, about one-third, will be used for the advertising department of the business, such as the printing of catalogues, &c., and possibly the publication of a weekly paper in the interest of the granite and building trades. At the west end of this building, extending toward the dam, Mr. Harvey contemplates building a foundry 50 x 40 feet. Mr. Harvey's three sons will continue to have full charge of the Hammer and Tool works and everything connected therewith, each having a department.

Prize Competitions

$25.00.

Prize Competition No. 19

SUBJECT :

Electrical Goods as a Part of a Hardware Stock.

The increasing demand for Electrical goods and their more general adoption in homes, hotels, stores, offices, public buildings, factories, and for street rail roads, makes the subject a pertinent one to the Hardware merchant, especially as Gun and Locksmiths are endeavoring to absorb this line of trade in many places. The competition is designed to draw out expressions as to the advisability of including Electrical goods in Hardware stocks; to what extent these goods should be carried; assortment of goods which can be handled profitably; the best manner of arranging and displaying these goods; whether installing and Electrical repair work should be included, and to what extent electrical devices can be supplied to manufacturers and to street rail roads.

This competition will remain open until April 29, 1893.

Those intending to compete are reminded that it will not be necessary to write long essays, but that comparatively brief and business-like answers will be favorably regarded as meeting the purpose for which these competitions are announced.

The following prizes will be awarded :

First prize	$12.50
Second prize	7.50
Third prize	5.00

The prizes will be awarded for answers which in the judgment of the committee of award are most suitable for publication and of the most general interest. We reserve the privilege of extending the time on any competition in case the contributions received are not of sufficient number or merit for the committee to award prizes. These competitions are open to every one, and it is hoped that there will be a general response from business men. We shall have the privilege of publishing any or all of the contributions received.

Replies are to be received not later than April 29, 1893. They should be addressed as follows :

DAVID WILLIAMS,

96–102 *Reade street,*

New York.

Prize Competition No. 19.

The committee to whom the contributions in Prize Competition No. 5 were referred have awarded the prizes as follows:

First Prize to H. S. DRUMMOND, Newark, N. J.

Second Prize to CHESTER G. AMBLER Danbury, Conn.

Third Prize to H. P. KING, Portland, Ore.

Other Competitions which have closed are now in the hands of the Committees of Award, who are giving careful attention to the claims of the different contributions. From the number of these and the evident merit of not a few of them, we are assured that a great deal of valuable information and suggestion will be put at the disposal of the trade.

The Weekly Prize Competitions noted below are now before our readers and remain open until the dates named:

No. 16. Closing April 8.

Three or More Rules to be Observed in Buying.

No. 17. Closing April 15.

How Merchants Should Treat Traveling Salesmen.

No. 18. Closing April 22.

The Extent to Which Merchants Should Devote Their Attention to Outside Interests.

No. 19. Closing April 29.

Electrical Goods as a part of a Hardware Stock.

Another subject will be announced in our next issue.

Bicycles.

SERCOMBE-BOLTE MFG. COMPANY, Milwaukee, Wis,, issue a catalogue, form 2, 1893, illustrating and describing their Ball Testing machine; Telegram Full Roadster and detailed parts of the same; Telegram Light Roadster; tubular frame connections; Sanger racer frame; frame of Ladies' Telegram; Lightning Messenger; Special Sanger Racer; Ladies' Telegram; Front Driving Safety; Telegram Pneumatic Tire; wrenches, pumps, cushion tires; saddles and Bicycle sundries.

The McIntosh-Huntington Company, Cleveland, Ohio, devote a catalogue to Bicycle sundries, in which a line of these goods is illustrated. Lucas' Lamps are first shown, many improvements having been made for the season of 1893, among which is a reduction of weight in the Holophote Lamps, and a use of Bull's-Eye Lenses in the entire line. Further illustrations include bells, whistles, luggage carriers, trouser guards, toe clips, padlocks, stands, cyclometer, saddles, tool bags, wrenches, pumps, oilers, &c.

Lindsay Brothers, Milwaukee, Wis., send an illustrated catalogue of Bicycles and cycling accessories. Views are shown of some 35 machines, varying in price from the Lindsay Pneumatic, a high grade Wheel, to a boys' Bicycle. Lamps, locks, shoes, coats, caps, clamps, bugles, &c., are also illustrated.

Washington Cycle Company, Washington, D. C., are introducing their '93 Capital Cycles, and state that they can suit any local fancy as to high head, any shape of handle bar, any kind of handles, any shape of seat post, and almost any make of saddle desired. They also offer a choice from several makes of tires. They call attention to the fact that in this way a rider can get a wheel made almost entirely to his order.

How to Keep the Store Neat and Clean.

FIRST ARTICLE.

BY M. W. CARLETON.

THAT HARDWAREMEN in general are noted for their enterprise and intelligence is a fact generally recognized, and for this reason it seems strange that so large a number of them are negligent of the arrangement and cleanliness of their storerooms. A great many of them who have scrupulously clean, neat and tidy houses, and who would quickly find fault at any breach of the laws of order therein, will permit their offices and storerooms, in which they probably spend more of their time, to become so untidy and unclean as to cast reflection on the entire craft.

The fact is, the old proverbs, "Cleanliness is next to Godliness" and "Order is Heaven's first law" are as applicable to the Hardwareman as to his fellow merchant in any other line of business. That it is possible to have a Hardware store almost if not quite as attractive as that of the clothier, dry goods man, or even the jeweler, may be demonstrated by a visit to a store of the modern class, such as are happily becoming quite common in most localities.

When the actual advantage, attractiveness and economy of such a store is seen, it is a cause for wonder that these facts are not more generally recognized by the Hardwaremen, who, of all others, have the reputation of being the most progressive and ready to adopt any advanced business methods. So, laying aside all moral and social considerations, it seems strange that there are so many stores of the "good (?) old kind" in existence at the present time.

OLD FOGY.

Comparing one of these with one of the modern, progressive class, the contrast is startling and the advancement of late years, especially of the last decade, very noticeable. In locating a storeroom of the former class the size is one of the principal considerations and such matters as light, ventilation and general arrangement are of minor importance. The shelves and counters are inconvenient, rough and unattractive features; the show windows entirely too small; the floor of wide pine boards, often warped out of shape, while Nail kegs, case goods, Agricultural Implements, &c., are disposed around the room with little regard for anything but convenience. Such a store as this can scarcely be made presentable even at the expense of prodigious labor. In contrasting the modern store the difference is such as ought to make even an "old fogy" a convert to the new *regime.*

PLENTY OF LIGHT.

In place of the plain, open shelves with untidy rows of goods, and the old, unsightly counters with the rows of Nail kegs alongside, there are the attractive, cleanly rows of drawers with the samples advantageously displayed on the background of green or black, and the broad, oak counters with the convenient bins for Nails, &c., beneath.

By these arrangements two of the principal causes of untidiness, viz.: the open, dusty shelves and the unsightly Nail kegs, are obviated. Another great improvement is the racks or brackets for Steel Goods, Shovels, &c., by means of which these articles may be suspended from the ceiling or wall, leaving the floor entirely accessible to the broom. The Stoves carried in stock are placed on trucks and may readily be moved for sweeping or display. Then the little untidy show case with its seldom-changed assortment of Knives, Scissors, Revolvers, &c., is superseded by a larger and more attractive one, with effective display arrangements, while still another improvement of much importance is the windows of large, clear glass, admitting plenty of light and dispelling the gloom usually found in so many stores of the older class.

ATTENTION TO CLEANLINESS.

So much for arrangement, for in that lies half the solution of the problem, but it is not the other and usually neglected half by any means, since no convenience of arrangement or elegance of fixtures can compensate for lack of attention to cleanliness. Of course it will be admitted that it is not as easy to keep a Hardware store presentable as some other lines, but it is not an impossibility by any means. A store may be scrupulously clean so far as freedom from dirt is concerned, yet be far from attractive and inviting, because of the untidiness and confusion. To prevent this is fully as important as sweeping and dusting. To this end waste baskets should be placed behind the counter at convenient intervals, in which all discarded wrappings, &c., should be deposited. Another cause of untidiness is the habit of leaving articles on the counter and ledges after a sale is made, and to avoid this salesmen should be instructed to replace everything as soon as possible. However, it is sometimes impossible to do this during the busy time, but it should be attended to at the first opportunity, since it not only improves the appearance of the room, but loss by theft, &c., is avoided.

ORDER.

Where purchases are left to be called for they should be carefully wrapped and plainly marked and put in a certain part of the store. It is important that there should be a certain place for this purpose, and one clerk should be made responsible for these packages as far as possible, as much confusion and annoyance will be avoided by such a plan. While replacing the stock the tools in use around the store should be returned to their proper receptacles and the loose Nails, &c., gathered up.

COVERING COUNTERS.

At the close of business the counters, cases, racks, &c., should be covered over with gingham covers to protect them from the dust caused by sweeping and dusting. These covers will be found very convenient, as they not only lessen the labor of dusting, but preserve the goods from damage and soon pay for themselves for this reason alone.

SWEEPING.

All stores should be swept daily, and if possible the sweeping should be done in the evening in order that the dust may settle during the night.

While sweeping seems simple enough, it is a fact that it is seldom properly done. To tell the average man that he does not know how to sweep will probably arouse his indignation, but it is true, nevertheless. To some it may sound ridiculous to talk about the "science" of sweeping; nevertheless, there is a knack about it which can only be acquired by experience. It is amusing to hear a man speak about the dust in his store when you know that he does not even dampen the floor before sweeping. This scarcely sounds reasonable, but there are many who do not do this. Dampened sawdust, scattered on the floor, is better than sprinkling, since it absorbs the dust, and the floor may be swept cleaner and more satisfactorily. The old broom in the hands of the average "junior" or porter is responsible for a great deal of the dust on the shelves. The sweeping brush is so much better in every respect that its use will be continued after one trial. While the first cost is greater, they are really more economical than the brooms, as one brush will outlast several brooms.

GET IT OUT OF SIGHT.

The old method of disposing of the sweeping or rubbish was to sweep it under the stove or in the corner, the easiest way to get it out of sight; but the proper way is to burn it wherever possible. If this cannot conveniently be done, it should be deposited in an iron can until it may be otherwise disposed of. It is important that an iron can be used, since there is danger of fire from cigar stumps, &c., where wooden receptacles are used.

DUSTING.

Next comes dusting, and it is very essential that this be thoroughly done. Good feather dusters should be used, the windows raised and doors opened, and every particle of dust removed. All shelf goods should be thoroughly dusted at least twice a week, and the upper tiers taken down and thoroughly cleaned. When doing this, the older or shopworn goods should be placed on the top, where they will be the first sold. Attention to these minor details will do much to improve the appearance of the stock.

After the dusting is completed, the showcases and windows should next receive attention, as a dirty, grimy case is worse than none, because it advertises carelessness and slothfulness instead of the goods, as intended. It will usually be found necessary to clean the showcases at least once a week, and the samples should be rearranged frequently. The best method of cleaning glass is to use a cloth dampened with alcohol and dipped in whiting, ending with a polish by means of a dry chamois skin. In this way a brilliancy is imparted which is not attainable otherwise. It is a common mistake in cleaning show cases to overlook the metal corners, and the effect is as bad as unfinished work in general. These should be brightened whenever necessary, but all traces of polishing material must be removed from the glass.

In summer much annoyance will be experienced from flies, and at that season windows and cases will require careful attention to keep them clean. An effectual and inexpensive protection against these pests is common colored mosquito netting.

A SEPARATE ROOM.

Unless it be possible to have a separate room or a certain part of the storeroom for the purpose of receiving and unpacking goods, much dirt and confusion is unavoidable. Wherever possible this work should be assigned to a responsible and trustworthy person, and all goods received by him should be entered in a book especially for the purpose and the invoices checked from it. This plan does away with many errors and the unpleasantness of claims for shortages is avoided, and it is not necessary to keep the goods out of stock pending the arrival of the invoices. Under no circumstances should the cases be trucked to the various parts of the store and there opened, as such a plan not only causes a great deal of untidiness, but the goods are frequently lost or stolen.

Attention should be paid to the samples in the showcases and on the drawers, and they should not be allowed to become soiled and rusty. Whenever they show tendencies of this kind they should be replaced by new ones at once.

ENTIRELY OUT OF PLACE.

Another point worthy of mention is the gaudy and senseless placards, &c., often displayed promiscuously around the room. They seldom improve the appearance of the store and in many instances are entirely out of place. Of course there are many which are really attractive and may be displayed to advantage, provided they are not too numerous, but nine-tenths should be thrown in the fire. There are many other points worthy of consideration which cannot be treated here from lack of space, but they will readily suggest themselves to any one giving the subject the study essential to its successful application, and it is to be hoped that the interest will continue unabated and the advancement in the next few years be as satisfactory as in the past decade.

John Humphryes, Jr.

THE DEATH of John Humphryes, Jr., secretary and treasurer of the Humphryes Mfg. Company, Mansfield, Ohio, occurred February 27 at New Orleans, Mr. Humphryes having been spending some time in the South hoping to recover his health, which had become impaired. The directors of the company with which he was prominently connected make appropriate reference to his death in a circular letter from which we make the following extract:

The Humphryes Mfg. Company is the creature of his brain, his excellent business ability and his untiring energy. He organized it, fostered it and, as its secretary and general manager, made it the prosperous plant it is—in fact, to his intense application in furthering its business may be traced the impairment of his health.

Months ago his associates saw the necessity for rest, if restoration to health was to come to him. He was induced to go and spend the winter in the health-giving climate of New Mexico; but he had delayed his going too long, and it became evident that the one obstacle he could not overcome, disease, the one enemy he could not conquer, death, were in the mastery. All that loving hearts and willing hands could do was done. His will-power prolonged the contest and his life for months, but he realized that the end was nigh, and he became greatly anxious to return to his home, but that bliss

was not to be his. On the return journey, while tarrying at New Orleans, La., on the morning of February 27, he passed away. His body was brought hither, and on Saturday, March 4, we laid him away.

Our patrons and friends will indulge us, and appreciate our feelings of sadness and sorrow at our final separation from one on whom we were accustomed to greatly rely, and to whose business sagacity and tireless energy our great prosperity as a corporation was due.

His associates take up the work where he laid it down, but we cannot refrain from giving publicity to an expression of our confidence in his integrity, our love for the man, and the almost irreparable loss we sustain in his death.

Price-List and Circular Case.

THE views shown in Figs. 766 and 767 represent case used by Geo. Krause & Co., Lebanon, Pa., for keeping small price-lists and loose circulars which it is desirable to preserve, and yet

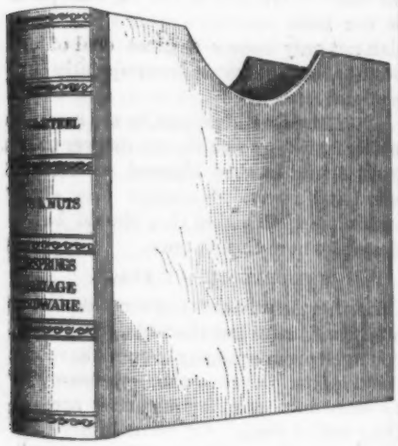


Fig. 766.—Price-List and Circular Case.

are difficult to keep in a convenient form for ready reference. The cases are bound in leather and cloth, of different colors, with lettering on the back describing the contents, which when put on a shelf side by side make a fine appearance, and re-

Fig. 767.—Appearance of Case on the Shelf.

semble to a marked degree a set of volumes. The most desirable size for these cases has been found to be 9½ inches high, 14 inches deep and 3 inches thick. F. W. Frost of Lebanon is the manufacturer, who has also made others for parties who have seen these at the above store.

Price-Lists, Circulars, &c.

BINDLEY HARDWARE COMPANY, Pittsburgh, Pa.: Spring and Summer Catalogue. Illustrations are given of Pocket Cutlery, Hay and Manure Forks, Hoes, Rakes, Cradles, Snaths, Lawn Mowers, Scythes, Horse Hay Forks, Handles, Scythe Stones, Lawn Sprinklers, Farm Bells, Barrows, Shovels, Screen Doors and Windows, Spring Hinges, Hammocks, Toilet and Horse Clippers, Water Coolers, Refrigerators, Carpet Sweepers, Bicycles, &c.

GEO. M. SCOTT & CO., Salt Lake City, Utah: A few facts concerning artistic Hardware. The pamphlet contains a reprint of "Builders and Hardwaremen," which recently appeared in *The Iron Age*, and is dedicated to all persons contemplating building.

BERGER BROS., Philadelphia, Pa.: Tinners' Hardware and Roofers' Supplies. Their 1893 catalogue describes and illustrates Trimmings, Enameled Tea Pot Knobs, Stove Turnbuckles, Leather Plungers, Solder, Soldering Coppers, Hooks, Pipe Fasteners and Cleats, Eave Trough Hangers, Star Steel Roofing, Long Eave Trough, Gutters, Spiral Lock-Seam Pipe, Galvanized Steel Ridging, Crestings, Finials, &c.

GEO. S. COMSTOCK, Mechanicsburg, Pa.: Agricultural Implements. Illustrations are shown of Feed Cutters, Cider Mills, Rollers, Sickle Grinders, Road Scoops, Bag Trucks, Saw Mills, Hay Rakes, &c. The circular referring to these goods is arranged in the form of an insurance policy.

THE NEVERSLIP HORSE SHOE COMPANY, Boston, Mass.: The Neverslip Cork Horse Shoe Pad. The manufacturers state that the Pad is so designed that it can at once be applied to the foot with any shoe, and that the Pad is open so that the sole of the horse's foot is exposed to air and moisture, preventing heating, while a cushion is provided for the horse's frog in the proper place.

NATIONAL SCREW & TACK COMPANY, Cleveland, Ohio: Iron, Brass and Nickel-Plated Wood Screws, Machine Screws, Stove Bolts, Tacks, Nails, Tire Bolts, Sink Bolts, Side Knob Screws, special Bolts, special Wood Screws, &c. A convenient catalogue, indexed through, showing page on which price-list and illustration appear, is issued by the above company.

MASSEY VISE COMPANY, Chicago, Ill.: Vises. A line of Perfect Vises as shown, including mechanics', coach-makers', lightning grip and wood workers', also the Tip Top Double-Acting Friction Drill. One movement of the hand is described as sliding the loose jaw of the Vise from and against the work, instantly fastening it, thus saving all the lost motion which might otherwise be required to hold various sizes of metal or wood between the jaws.

THE BELCHER & TAYLOR AGRICULTURAL TOOL COMPANY, Chicopee Falls, Mass.: Agricultural Implements. Illustrations are given of Sulky and Walking Plows, Shovel Plows, Harrows, Cultivators, Hoeing Machine, Tobacco Ridger and Potato Coverer, Feed Cutters, Vegetable Cutters, Corn Shellers, Barrows, Trucks, Fan Mills, Tedders, Horse Rake, &c.

IRVING D. BOOTH, Elmira, N. Y.: Iron, Steel and Heavy Hardware. Among the goods represented in the catalogue are Bar Iron, Horse Shoe, Band and Hoop Iron, Light T-Rails, Angles, Steel Channel Bars, Steel I-Beams, Norway and Swedish Iron, Cast, Machinery, Tire, Spring and Cant Hook Steel, Steel Shafting, Black and Galvanized Iron, Nuts, Washers, Bolts, Spikes, Rivets, Horse, Mule and Ox Shoes, Chain, Wire and Cut Nails, Wrought Iron Pipe, Well Casing, Bright and Terne Plates, Metals, Copper, Wire, Glass, Metal Roofing, Troughs, Spouting, &c. Tables of weights and dimensions add to the value of the catalogue.

After Mexican Trade.

BY WM. H. MAHER, TOLEDO, OHIO.

No. V.—City of Mexico (Continued).

PASSING ALONG the finest streets of the city after business hours, one cannot help but notice the solid iron shutters and the three or four padlocks on every door. Surely these are not needed as against burglars? No, they are as defense and protection in time of riots and political broils.

Mexico has been the scene of many political revolutions, and one merchant told me that in his experience he had to put up his shutters many times to save his windows from flying bullets.

Under President Diaz, who is serving his fourth term, the country has prospered and the business community unite in praising him. His predecessor was Gonzales, who is commonly reported to have increased his wealth $36,000,000 during his four years' Presidency. This may explain why a high tariff is needed in Mexico to meet current expenses and interest on public debts. Now for my trade notes: Mr. Geo. Glessner, manager of the Champion Mower & Reaper Works, Springfield, Ohio, after a thorough canvass of the Republic for his goods, told me the trade there was not worth looking after. One agency in the city sold about 20 Mowers per year. He said that he could sell more machines in one good county in Ohio every year than in all of Mexico.

Mr. Tuscano of New York, of the Babcock Plated Ware Works, found no trade, but did not make much effort, as his trip was largely for the benefit of Mrs. Tuscano's health. Mexico ought to be a fair field for Plated Hollow Ware. So far as I could judge the Meriden Britannia Company now have the most of that trade, but judicious advertising in the high-class Mexican papers would increase the demand.

In Flat Ware I found goods of William Rogers & Co., Rogers & Bros., Holmes & Edwards Silver Company, Hall & Elton Mfg. Company (old patterns), and Simpson, Hall, Miller & Co. English Plated Ware is quite common, too, but American goods appear to have the lead.

One of our party represented Bliven & Carrington, Lubricating Oils. He was a native of Spain, and so was at home in speaking with Mexican trade, and he seemed to be having a very successful trip.

Mr. Scoville, manufacturer of the Perfection Oil and Molasses Gates, found his goods already well introduced to the Hardware trade of Mexico, through the Simmons Hardware Company, and Hibbard, Spencer, Bartlett & Co. When he showed his card to a retailer in San Luis Potosi, he was met with the remark:

"Yes; we know your goods; we have them in stock."

Curious to learn in what quantities he bought he asked the question, and was answered:

"I bought one gross."

They stepped back to the stock shelf and Mr. Scoville saw there were about seven dozen on hand. Such a concern in the States would not buy over three dozen at one time.

An article like Brown's shoe dressing must be used by the masses to be profitable to the dealer. The masses in Mexico do not wear shoes; a large part go barefoot; another very large part wear sandals. But the higher class ladies are very proud of their feet and wear expensive shoes. The contents of a case of shoe dressing, packing and strong box, makes a very heavy package, and the tariff being on the gross weight the goods cost heavily in the Mexican store. Hence, a bottle of the dressing that can be sold for 10 cents in the States must be sold at from 35 to 45 cents in Mexico.

But Mr. Rowan found the Brown dressing on sale and was encouraged by his trip to look up the question of advertising and arrange to push the trade there hereafter.

In the matter of steam boilers, as reported by Mr. Anderson of Harrisburg, those seen there are mostly from the States. Of course, there is no such continual growth of factories as here; yet the spirit of progress is felt there. Mr. Anderson secured orders for his boilers and looked upon his trip as a profitable one.

The development in Mexican railroads has opened a market for cars, and every city of any importance has its street cars. Our companion, G. M. Brill of Philadelphia, had already made cars for almost every city line in Mexico, but he now found it profitable to make the personal acquaintance of the various officers, and came home with some fine orders in his pocket.

The milling industry in Mexico is in a crude state. This branch was well looked up by Aug. Wolf of Chambersburg, manufacturer of Flour Mills. The common people eat corn and do their own grinding on a crude stone. Flour mills are old-fashioned, and but little encouragement was given about changing. It appeared strange to me that our Northern millers had not worked up a trade in Mexico for their low-grade export flour. In the dry regions such flour could be sold at less than the people pay for corn.

The furniture trade in Mexico is confined to the upper classes. Looking into the open doors of scores of poor houses one rarely sees a chair, or bedstead, or table. Occasionally there is a cheap little stand for the lamp. The bed, mostly old clothes, was made on the earthen floor, and people squatted on the ground in lieu of sitting on chairs.

But the well-to-do people delight in nice furniture, and Mexico would be a good market were it not for the tariff, which is particularly burdensome on this line. Our Mr. Yager of Allentown made some sales in almost every city in which we stopped, and I saw furniture in the shops from Chicago and Grand Rapids.

As a sample of prices, I saw a fair-looking table, such as would sell in the States for $4 to $5, sell here for $12. A parlor chair, worth, say, $10 in the States was offered in one window at $33. Of course such prices limit sales.

Mr. Brooks, representing "Sterling" pianos, had previously never sold goods in Mexico, but came home with an order from a leading dealer that made his trip profitable.

F. E. Myers of Ashland, Ohio, is manager of two concerns, whose interests he was looking after—Myers & Bro.'s Pumps and Canton Plows. I have already given memoranda of what was discovered in the Plow trade, the sales being mostly in a very cheap Plow, made specially for that market. In Pumps, while several American names are known there and their goods sold, a larger share of the trade seemed to be in a very inferior German Pump, and Mr. Myers' special efforts were to dislodge that and work in his goods. He secured several very gratifying orders and was well pleased with the results of the trip.

The Crane Company of Chicago had a representative with us, but this concern are already well known in Mexico. A Crane elevator took us up and down in the Hotel Iturbide, but it only runs between 8 a.m. and 10 p.m. The early, as well as the late, birds had to walk. The concern were also well known in mining and railroad circles, where they have a good trade.

The Bicycle trade of Mexico is just coming into being. Up to one year ago Bicycles were prohibited on the city streets, but this law was revoked, and Bicycles are now seen everywhere. A representative of the Western Wheel Works, Chicago, was with us, although the factory has given Mexico trade to the Simmons Hardware Company, and the business done by Mr. Boericke was turned over to the St. Louis house. He took a nice order in the City of Mexico.

President Diaz's son rides on an elegant nickel-plated Columbia, for which he paid $300. In the Mexican *Financier*, a paper apparently controlled largely by Seeger, Guernsey & Co., the following Bicycles are advertised: The Liberty, Niagara, Union, Sund, all American machines. Boys' Tricycles are not seen in any number, and that trade is waiting for some one.

Baseball has just come into popularity, and will eventually take the place of bull fighting, which, in nearly every State in Mexico, has been prohibited, because of its brutalizing effects. Spalding & Co., apparently a branch of our Spalding Baseball concern, have a store in the City of Mexico. In southern Mexico clubs were out playing, for though you were having a blizzard in New York it was 92 degrees in the shade at 3 o'clock p.m. in Yucatan.

Walker & Sons of Canada sent a gentleman with us to look up the whiskey trade. In all but the northern part of Mexico the drink of the common people is the juice of the century plant—pulque (pronounced pool-ke).

This plant grows in poor soil, regardless of rain or irrigation. It is seven years in coming to proper condition; then the heart is cut out, leaving a bowl-shaped receptacle in which the juice gathers, and this juice is drunk by the natives. It looks like blue, watery milk; it smells and tastes like yeast. It is sold for 1 cent a glass. It has a powerful effect on the urinary organs, and is said to cure Bright's disease. It spoils in three or four days, and no process has yet been discovered by which it can be kept longer, hence is never sent out of the country. A prominent official told me that from the best data he and others had, the common people of the City of Mexico spent $5,000 per day for this drink. They want it morning, noon and night, and as much oftener as they can get it.

By distilling pulque a fiery liquor is obtained, called mescal, which burns and tastes like forty-rod new gin, and is wildly intoxicating, producing an ugly, fighting, murderous drunk. It is sold at a few cents a glass.

The better classes take as their favorite drink French wines, champagne and brandy, which are as cheap in Mexico as in New York. Our American whiskeys are not much drunk there, though Kentucky labels are by no means rare on the shelves.

Mr. Porter, who represented Walker & Sons, had great difficulty in overcoming the popular demand for brandy as against whiskey, but he sold Canada whiskey in every city we were in, and I think made a very successful opening for his goods.

Mexico is by no means backward in electric work. We found every city of 4000 inhabitants and upward lighted by electricity. None of the street car lines were run by it, but mules are cheap, streets are narrow, and were I at the head of affairs I would hesitate about having wires and poles fill these streets. Factories and hotels were lighted by electricity, and the Brush engine seemed to have almost a monopoly. The handsome $300,000, opera house at San Luis Potosi will have an electric plant in it. Mr. Augier, representing the Mather Electric Company thinks he is tolerably sure of this contract.

In conversation with an American of musical tastes, resident of Mexico, he told me there was a good opening there for melodeons and parlor organs. The Mexicans are a musical people; the band is playing every evening on the plaza for the populace. He said a company that would send down lady teachers, and would push the organ trade would soon work up an immense business.

The American sewing machine is well represented in every city. It usually has one of the finest stores on the best streets, has handsome signs, and lets its praises be known. I fancied I saw the Singer, Home, Domestic, and Remington advertised more generally than any others.

These are my notes, as I gather them in talk with my companions, and represent a variety of goods and our experience to the time of leaving the City of Mexico. In Pueblo I spent a large part of a day with a Hardware salesman, who has been there for years selling American Hardware in Mexico, and in my next I will give notes of his experience and a list of American Hardware most popular there.

(To be continued).

Arrangement of Stores.

SPORTING GOODS.

A VERY NEAT and compact arrangement of sporting and athletic goods is shown in Fig. 768, for which we are indebted to Case & Uehren, Aurora, Ill. The space of 26 feet between the show window and stairway is devoted to Baseball Goods,

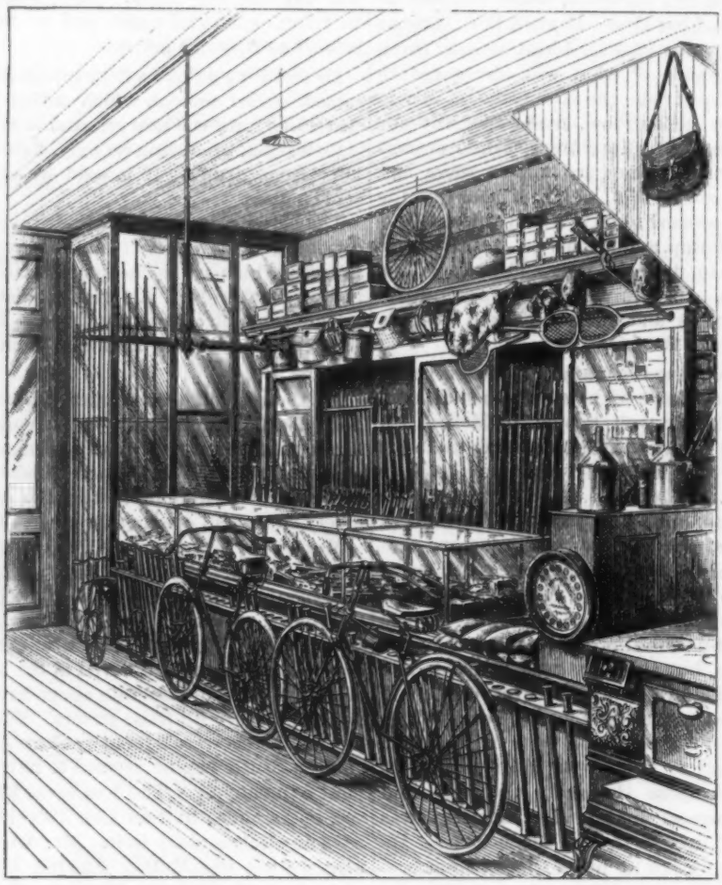


Fig. 768.—A Sporting and Athletic Goods Corner.

Fishing Tackle, Tennis Goods, Guns, Rifles, Fishing Rods, Boxing Gloves, Hunting Coats, Game Bags, Cartridge Belts, Indian Clubs, Dumb Bells, Loaded Shells, Cartridges, Powder, Shot, Bicycles, &c. The wall case is 12 inches deep, lined with black velvet, and will hold a great many goods. The case is provided with sliding glass doors, the first two spaces being devoted to Guns, the next two to Rifles, and the next two to Fishing Rods. Rackets, Masks, Minnow Pails and Fish Baskets are displayed above the cases. Next to the wall case, under the stairway in the angular corner, Loaded Shells, Gun Wads, Loading Tools, &c., are kept. Under the wall case are two rows of drawers used for storing goods out of season. In front of the wall cases is a long counter, with two show cases, for small goods. In the first case is kept Small Fishing Tackle, Artificial Baits, Lines, Reels, &c., and in winter Skates, &c. The next case is used for Revolvers, Bicycle sundries, Duck Calls, Dog Whistles, Gun Cleaners, &c. To the rear of the bags of Shot is a scale for weighing Powder and Shot; next to which is the Shot case and and Powder cans. The space under the counter is used for storing Indian Clubs, Dumb Bells, Minnow Pails, &c. In front of the counter is a rack for containing Baseball Bats, as shown in the cut. Bicycles are stood along in front of this counter. Another display of jointed Rods is made around the show window, as shown in Fig. 769. The upper portions of the Rods are held in a strip of rubber belting 1 inch wide, tacked on the sash bar and cut to receive the Rods. The butts stand on a board strip around the bottom of the window 6 inches from the floor, in which are holes bored half way through. This rack holds 18 Rods and has the advantage of keeping them always in sight, and, being put together, they are always ready to show customers.

The show window is 5 x 3½ feet in size, with plate-glass front. This window is always trimmed with sporting and athletic goods; and with frequent and attractive changes, always attracts attention. The firm have thus gained the name of being headquarters on sporting goods. As a result of their window display, they state that when a large tennis club was formed last summer they filled the window with Rackets, Nets, Caps, Sashes, Balls, &c., and had supplied one-half of the members with outfits before their competitors awoke to the fact that a club was being fitted out. They carry about $2000 worth of sporting goods, and find it a very profitable stock to carry in connection with their Hardware goods. They advise, as the result of their experience, buying the best, as well as cheap and medium grades, of these goods, as they find sportsmen do not object to the price, but want the best of everything.

Logan, Gregg & Co.

LOGAN, GREGG & CO., Pittsburgh, Pa., are sending to their trade an interesting pamphlet, tastefully arranged, entitled "Removal." A page each is given to answering the questions, Who? Why? Where? When? The answers are in substance as follows: The above firm having for several years been doing business at a disadvantage, for lack of room, have removed to a large warehouse built especially for them on Seventh street, between Penn avenue and Allegheny River, the contemplated change being made during March, 1893. An illustration is given of their old stores on Wood street, occupied by them for more than 60 years; and also of their new building, which is a handsome, substantial edifice of six stories. A map is given showing the section of the city in which their new quarters are located, also plans of their offices and salesrooms on the first floor and the arrangement of the second floor. The building is furnished with electric lights, heated by steam and provided with elevators. The business was established in 1831 by John T. Logan and Robert T. Kennedy, as Logan & Kennedy. In 1848 the style of the firm changed to Logan, Wilson & Co.; in 1857 to Logan & Gregg, and in 1867 to Logan, Gregg & Co. Pictures are given of John T. Logan and Edward Gregg.

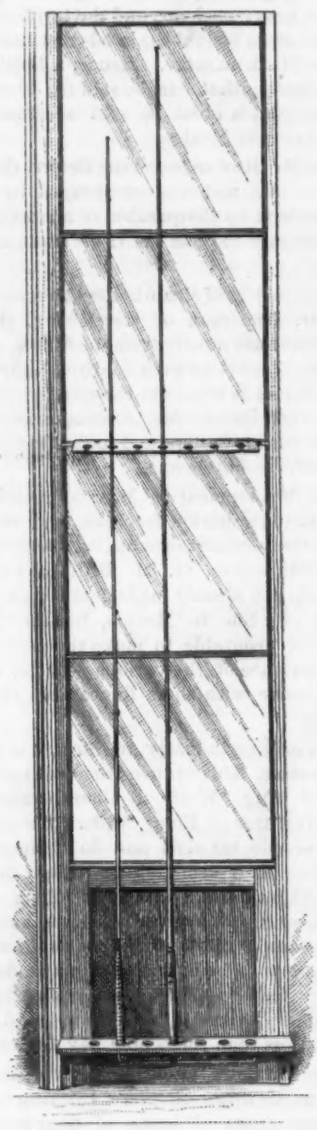


Fig. 769.—Fishing Rod Rack.

Screen Wire Rack.

WM. KEMPF, 2814 Market street, St. Louis, Mo., has made a Screen Wire rack for his own use, as shown in Fig. 770.

The width of the roll of Wire is numbered on the front of each shelf and the rack is so arranged as to hold all the different sizes. At the bottom of the rack between the uprights are two shelves which may be utilized for odd lengths of Wire, or for other articles that require but little room. The lumber used in its construction was obtained from window-glass boxes, which of course cost nothing, and the labor was equally inexpensive, as the rack was made at times when

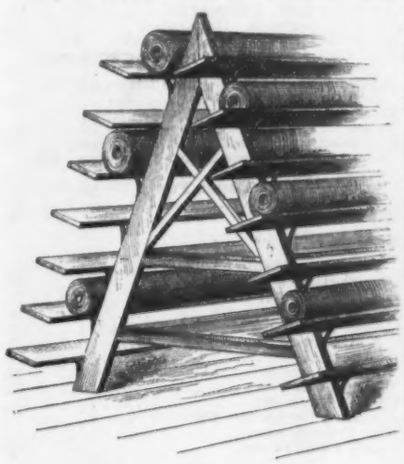


Fig. 770.—Screen Wire Rack.

there was nothing else requiring attention, so that the entire cost consisted of the nails and brackets, probably about 75 cents.

Patterson, Gottfried & Hunter's Catalogue.

PATTERSON, GOTTFRIED & HUNTER, 146 to 150 Centre street, New York, have just issued a large catalogue, representing their stock of Machinery, Metals, Hardware, Tools and Supplies. The book is 10 x 13 inches in size, containing over 500 pages, substantially bound in cloth. Over 1,500 illustrations are shown, together with list prices and valuable tabulated matter; while the arrangement indicates much thought and labor. The index is very complete, occupying 20 pages near the front of the book. A careful study has been made of the requirements of machine shop, factory and mill, so that many goods not usually considered as belonging to these lines are now included. Many of the lists are given in a more compact form than heretofore, while others which were compiled separately are now grouped under one head. Descriptions in words have been so far as possible omitted, the dimensions and list prices being depended upon to give the necessary information, and the phrasing has been reduced to the utmost simplicity consistent with clearness and explicitness. A saving of space has resulted from omitting lengthy descriptions, and by throwing, as far as possible, various tables into one, so that the book contains a large amount of matter, without giving the pages a crowded appearance. Among the goods listed, are Roll and Sheet Brass, Embossed Brass, Perforated Brass, Tin and Copper, Brazed Tubing, Wire, Steel, Screws, Bolts, Nuts, Nails, Tacks, Rivets and Burrs, Milling Cutters, Metal Saws, Gauges, Calipers, Steel Rules, Squares, Drills, Reamers, Taps, Dies, Screw Plates, Files, Checks, Wrenches, Clamps, Cutting-off Tools, Knurls, Mandrels, Dividers, Pliers, Vises, Chisels, Auger Bits, Carving Tools, Saws, Plumbs and Levels, Gas Burners, Measuring Tapes, Oilers, Fire Pots, Molders' Tools, Gas Blast Furnaces, Forges, Blowers, Lathes, Shapers, Shearing and Punching Machines, Grinding Machines, Pulleys, Gears, Belting, Brushes, Packing, Steam Gauges, Pipe and Fittings, Lanterns, Electrical Goods, Acids, &c. From the foregoing enumeration an idea of the range of the stock may be obtained.

Suggestions as to Improvements in Putting Up Goods.

FIRST ARTICLE.

BY BERNARD B. NEAL.

I TAKE it for granted that manufacturers understand very distinctly that the bulk of their goods are finally sold at retail in small quantities. Also, that it takes a great deal of time and labor to retail enough Hardware to amount to much in the way of money. Hence it is very important that they should study how to save time and labor to the retailer, and certainly the manufacturers have a good chance to save the retailer much time and also to increase sales by simply putting goods up in a good and attractive manner, and not letting a little extra cost stand in the way of doing so. To prove this I will mention some few things that occur to my mind, as follows:

First.—Paper boxes with metal corners should not be used, because after the cover is taken off it is hard to put it on again.

Second.—Good, strong thin paper should be used to wrap up articles that are packed in boxes of dozens, &c. Most of the paper now used is simply of no use whatever. For example, take a box of Locks, Bolts, &c.; take one out of its wrapper and show it to a customer; then try and put it back in its original shape, and you will find that you will have to get a good piece of paper in order to do so. I would suggest that good Japanese paper be adopted for this purpose, as it is thin, tough, and I believe cheap.

Third.—Manufacturers should refrain from putting printed advertisements with their name and address in goods. This is a feature that many of them have adopted, in fact they do up all articles with regular printed paper that informs a jobber's customer just where the goods are made, also that if he writes direct he can probably get a lower price; if this supposition is not a fair one, why do the manufacturers do it? The jobber has a hard enough time as it is to sell goods at any sort of a profit. So I say leave out the advertisements.

Fourth.—Labels should be printed in black letters on a light-colored paper, the numbers and name of articles in as large type as possible so that a person can read the name at a distance; it will often save running for a ladder to see if you have the article on shelf a few feet up. By all means let the old green and red labels go, and give us new, attractive and readable ones.

Fifth.—Labels should be put on in such a manner that none of the reading matter is hid. Sometimes we have goods labeled in such a manner that one must take off the cover of the box in order to read all of the labels.

Sixth.—This is an age of advancement and improvement, and the Hardware trade are quick to appreciate goods that are put up in such a manner as to make their stores look pleasant to their customers, and I know of no line of goods that will make the same show as an attractive and clean stock of Hardware. The above remarks refer in a general manner to all Hardware. I will now mention some goods that I believe can be improved on, and in the method of putting up:

PADLOCKS

should have their respective Keys tied with good strong twine of suitable length to each lock.

DOOR LOCKS

should be tied up with their respective Keys, Escutcheons and parts in a good manner. I sometimes hope that the day will come when each Lock will be done up in a paper box like Night Latches now are.

CASTERS

are done up very poorly. Why not put them up in sets and then put them in a wooden box, instead of paper, which breaks and lets out the sockets?

WRENCHES

are very heavy, but most of the makers stick to paper, and very poor paper at that; and at the least handling the wrenches break through the paper and look very unsightly, thus time is lost in putting them in shape again. Let them be put in boxes.

THUMB LATCHES,

blind and gate hinges, blind fasts, &c., are very cheap, but I believe they would bring a better price if they were put up nicely. A clerk could sell one complete without losing so much time in finding all the parts. They should be put up in cheap boxes similar to the way the parts of Torrey's door spring are. In any case, have them so that a set can be sold complete without a clerk having to get a catalogue and studying how many pieces belong to a set.

HAND BELLS

would be much nicer in paper boxes instead of plain paper, as now. They are a nice line of goods and would stand being put up in a convenient and tasty manner.

DOOR BOLTS

should be put up better, so that the nosings and screws do not get lost.

BRACES

should be packed in wooden boxes containing ½ dozen, the better quality in nice paper boxes containing one only; a carpenter will think more of it.

SAWS

should be put up better; the good ones in nice strong paper, covering handle and all, so that the teeth cannot be damaged in handling; the outside boxes are about right.

WOODEN PLANES

are very poorly put up; better paper and nice labels would help a great deal.

AUGER BITS

should be wrapped separately and put in wooden boxes, so as to protect the points and thread.

HATCHETS

should be put in wooden boxes containing partition for each hatchet, each blade should be well done up in paper. The using of paper boxes in putting up hatchets has caused many a bad cut to the novice in hardware.

AXES,

unhandled, should be put up in paper boxes of one only, with the edge well protected, and the weights marked on each.

ARTICLES

put up in sets, such as chisels, &c., should have the size marked on the paper of each in a prominent manner, this will save time in finding out the size, &c. I could specify many more things, but think the above the most important, as they worry the retailer to a certain extent every day. The manufacturers may complain about the expense, &c., to them, but I believe they can and will in time do much more than I have named in the way of improvements in putting up hardware. I know that corkscrews are imported from Germany at 18 cents per dozen, put up in a real nice strong package, containing ½ dozen only, and we certainly can put up goods as neatly as any nation on earth.

Reading Hardware Company's Chicago Store.

AMONG the many points of attraction for Columbian Exposition visitors outside of the Exposition grounds will be the new store and sample parlors of the Reading Hardware Company at 78 Wabash avenue. The arrangement of this establishment is admirable, both for the transaction of business and the proper reception of visitors who may merely desire to examine the samples, the former department being separated and entirely distinct from the latter. Facing the avenue is a handsome show window 15 x 28 feet in dimensions containing mounted samples of door locks and a few selections in ornamental goods, with a richly draped curtain in terra cotta velvet for a background. To the left of the window is a doorway 7 feet wide, leading into a spacious vestibule executed in paneled oak, from which the visitor may pass directly into the sample parlor on the right or to the reception room beyond, the various entrances being draped with velvet hangings in neutral tints. The Reception room is a cozy apartment with handsome oak panelings and furnished with an ample settee and large comfortable easy chairs richly carved and upholstered in russet leather. From the reception room, customers or visitors are conducted either to the offices or the sample-rooms as they may elect. The interest of the visitor will be mainly centered in the parlor assigned exclusively to the display of samples. This room is 15 x 28 feet in size, fitted up in Colonial style with parquet floors, partially hidden by Persian rugs and furnished with artistic tables and easy chairs. Around the walls and in the center are sample cases in which goods are ingeniously and tastefully arranged in a profusion of styles, designs and finishes in genuine Bronze, Aluminum and Iron. These samples represent complete lines of the goods manufactured by the Reading Hardware Company. They may be examined at any time by visitors of both sexes or by members of the Hardware trade, who will always be courteously received and warmly welcomed. The packing, shipping and order departments, together with the offices of the company, are all in the rear of the reception and sample-rooms, being separated therefrom by elaborate screens of carved oak.

It Is Reported—

That the Hardware store of Landkamer Bros., Alexandria, Neb., was entered by burglars on the 15th ult., and $150 in cash and goods stolen.

That the Implement store of J. P. Johnson, Creighton, Neb., was destroyed by fire on the 14th ult.

That the Macon Hardware Company, Macon, Ga., have commenced the erection of a new building, which they will exclusively occupy. The building will be three stories high and will have a frontage of 52½ feet and a depth of 175 feet.

That the Hardware firm of Erickson & Emmons, Ironwood, Mich., have dissolved.

That Harper & Streif, dealers in Hardware, Stoves, &c., Monroe, Wis., have dissolved partnership. Streif & Lewis are successors in the business.

That B. A. Clark, Hardware dealer, Brattleboro, Vt., has disposed of his business to J. E. Mellen and W. H. Proctor. Mr. Mellen has been in the Hardware business for about 15 or 20 years, and was Mr. Clark's head clerk for eight years. Mr. Proctor has also had some experience in connection with the selling of Hardware. Mr. Clark has retired after 43 years' continuous service in Brattleboro mercantile life.

That A. H. Funk has disposed of his Hardware business at Milan, Ohio.

That George Lamkin, Hardware merchant, Norwalk, Ohio, has sold out his business to Butt & Friend. He retires after 21 years' connection with the Hardware trade.

That Harry C. Read, Hardwareman, Bloomington, Ill., was married on the 22d ult. at Indianapolis, Ind., to Miss Minnie Bowman of that city. Mr. and Mrs. Read will make a two months' trip through the South, visiting New Orleans, and will subsequently settle down in Bloomington.

That the Hardware store of Funkhouser & Nash, Zionsville, Ind., was damaged by fire on the 20th ult.

That Frye & Wade, Caliope, Iowa, have sold out their Hardware store.

That G. H. Bantelle has sold out his Hardware stock at Sheldon, Iowa.

That Jacob Bigler & Son, Imperial, Neb., have disposed of their stock of Hardware.

That John Henderson, Hardware merchant, Wheeling, W. Va., has become the owner of the building in which his business is located.

That W. A. Stuart & Co., Hardware dealers, Livermore Falls, Me., are making extensive improvements in their Hardware store.

That Albert C. Burgess, Hardware merchant, Belfast, Me., has taken possession of his handsome new store.

That Walter Stevens of Lisbon Falls, Me., has opened a Hardware store at Lisbon.

That Wicks & Gilbert have opened a new Hardware store at Salem, S. D.

That Green Bros., dealers in Hardware and Implements, are thinking of removing from Denison, Kan.

That William T. Reckner's Hardware store in San Francisco, Cal., was damaged by fire on the 22d ult.

That there is an opening for a Hardware and Implement Store at Cedarville, Kan.

That the store of Whitt & Bonney, Hardware merchants, Lynnville, Tenn., was destroyed by fire on the 26th ult.

That on May 1 a consolidation of the Stove and Tinware stores of C. S. Whitcomb & Co. and Kirkham & Hazen, Springfield, Mass., will be effected. The new firm style will be Whitcomb, Kirkham & Hazen.

That J. S. Farley, dealer in Hardware and Implements, Milbank, S. D., has been succeeded by Farley & Benedict.

That the firm of Price & Cox, Hardware dealers, Marion, Ind., has been dissolved by mutual consent. The business will be continued by L. K. Price under the style of Price & Co.

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New Idea Double-Acting Spring Hinge.

The illustrations shown herewith represent a double-acting spring hinge being introduced by the Stover Mfg. Company, Freeport, Ill. The hinge is made up of a jamb plate having ears, upon which is hung the leaf. It also has a stationary steel pintle to swing on, and it is impossible, it is stated, for the door to sag. As shown in Figs. 1 and 2, the hinge divides at the center (pintle line) by removing four screws. This arrangement, the makers remark, makes it easy to fit the leaves to the door, and to attach the jamb plate to the jamb. Attention is called to the fact that it is not necessary to round off the edge of the door, as the jamb plate and strip is concaved, allowing the corners of the door to pass through the circle of concave; also that the rear joint of the door is always covered, whether the door is partly or wholly open or closed. The working parts of the hinge are confined entirely within the jamb plate, Fig. 3, admitting, it is claimed, of its being taken apart and applied to the door with ease, and without danger of injury to the workman. Fig. 3 also shows the hinge as applied to the door, and gives a top and side view of the concave strip attached to the jamb. The hinges are made in japan and ornamental finishes, and in sizes for doors from ⅞ to 3 inches thick.

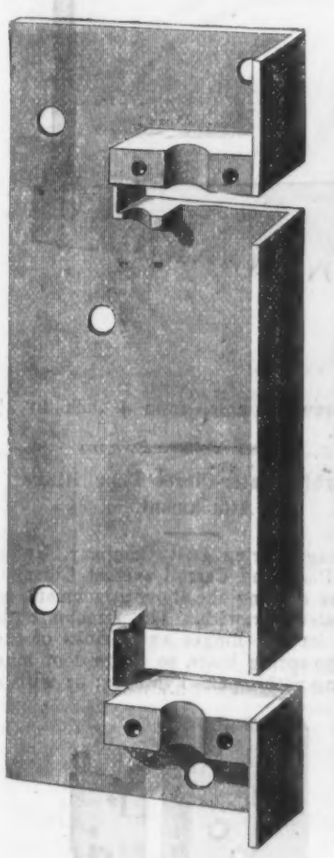


Fig. 1.—Hinge Divided at the Pintle.

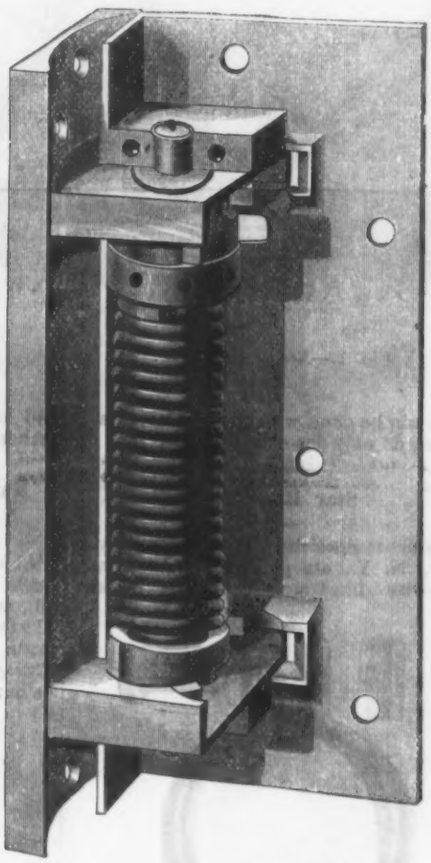


Fig. 2.—Leaf of Hinge in Position.

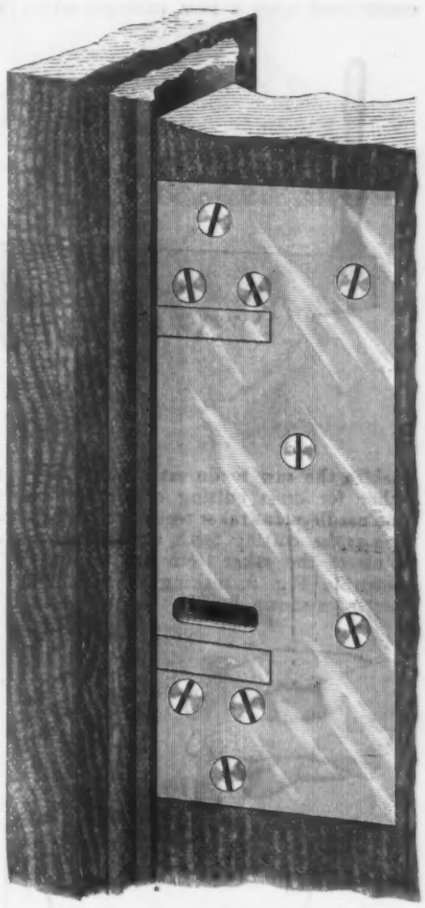


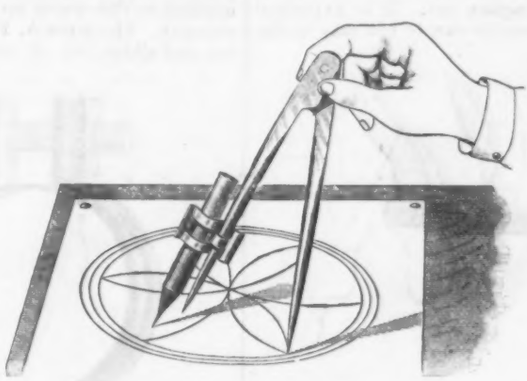
Fig. 3.—Double-Acting Spring Hinge Applied to Door.

Columbian Enameled Steel Kitchen Ware.

Bellaire Stamping Company, Harvey, Ill., are manufacturing a line of these goods, noticeable among which are tea and coffee pots. These are made with both tin and enameled covers. The enamel, it is remarked, differs slightly in appearance from other enameled ware on the market.

Double-Grip Pencil Clasp.

Wm. H. Jacobus, 90 Chambers street, New York, is offering the above device, as illustrated herewith. The wedging action of the compass causes the clasp to grip the pencil rigidly, and a fine adjustment for the size of the circle is obtained by turning the clasp on the compass leg. The pencil may be easily adjusted in the clasp by loosening the clasp on the compass leg. The point is made that the clasp when attached to a pencil prevents it from rolling off the desk, and also serves as an eyelet for attaching a string. The clasp is made of rolled brass, nickel plated, and is designed for use on compasses or trammels, and for machinists, carpenters and draftsmen; also for use in schools.



Double-Grip Pencil Clasp.

Cycle Starting Gear.

We learn from a contemporary that one of the novelties at the National Cycle Show in London was a starting gear. It is described as a contrivance for enabling the rider to mount and start without "pushing off" or hopping—expedients which are very trying to beginners, and especially to ladies. The gear is actuated by a powerful spring, and can be fitted to any type of machine and to any revolving part, preferably to the crank axle or the driving wheel. The spring is released automatically as the rider mounts the machine, and impels it a distance sufficient to enable the rider to settle himself (or herself) comfortably and to find the pedals. The inventor also claims that the gear can be made to serve as a temporary assistance in ascending hills. This may fairly be classed among the ludicrous inventions which hinder rather than aid riders. As

the tendency is toward lighter machines each year, and these machines stripped of all unnecessary parts, the device is not likely to come into favor.

Needle-Point Saw.

The S. A. Haines Company, corner Second and North Alabama streets, Indianapolis, Ind., are introducing saws with needle-point teeth, as shown in Fig. 1. It is remarked that the needle point saw is constructed upon a new principle which

Fig. 1.—Needle-Point Saw.

enables the saw to do satisfactory work either for cross cutting or for ripping. The needle-point raker teeth are made as long as the cutting teeth, after which the points of the raker teeth are turned, as shown in Fig. 2, making them a trifle shorter, as shown in Fig. 3. A bevel is

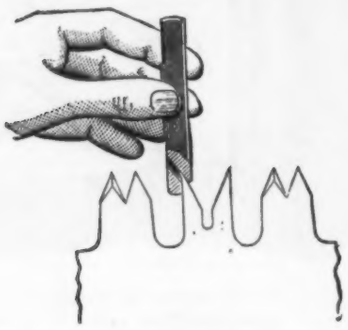


Fig. 2.—Turning the Raker Teeth.

filed on each side of the raker tooth, which, having the point turned forward, forms a cutting edge on each side of the raker, which, it is stated, will make a sliding cut instead of a square cut. It is explained that this causes the saw to run easy in ripping and in cross cutting; if the grain of the wood or knots should run lengthwise in the cut, and the cutting teeth could not cut them out, the needle-point raker teeth will do the work. The manufacturers claim that the raker teeth will clean out the dust as deep as the cutting teeth,

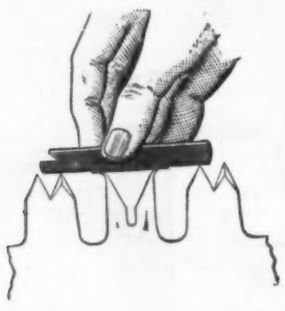


Fig. 3.—The Teeth in Detail.

which makes the cutting teeth run freely; that the cutting teeth in the needle-point saw do not have to run as deep in the wood as the cutting teeth in a saw where square or common raker teeth are used, and that the needle-point raker tooth keeps the saw in the center of the cut, making the saw run steady and without rattling. Cross-cut, one-man cross-cut, hand and wood saws are made with needle-point teeth. It is stated that the needle-point hand saw is adapted for ripping, cross cutting and miter sawing, doing all kinds of sawing smoother and more easily than can be done with the ordinary saws which do only one class of work.

Star Hose Band.

Syracuse Specialty Mfg. Company, Syracuse, N. Y., are putting the hose band herewith illustrated upon the market.

Fig. 1.—Star Hose Band.

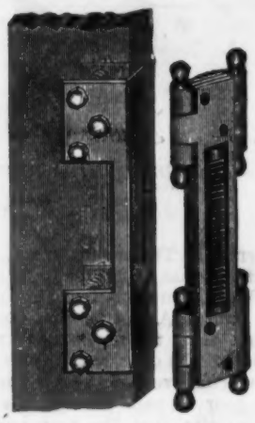
The bands are made of rolled strip steel, plain or coppered; well adapted, it is remarked, to this use on account of its tensile strength. The piece A, Fig. 1, is adjustable, and slides out of position when the

Fig. 2.—As Adjusted on Hose.

band is being placed on the hose, obviating the necessity of spreading the band enough to destroy its form. After the band is in place on the hose the adjustable piece is slid into position, Fig. 2. This arrangement, it is stated, allows the end of the band to draw over it uniformly from both sides. The manufacturers claim that there are no sharp ends to destroy the covering of the hose or to imbed themselves, thus preventing the tightening of the screw; that there is no strain whatever on the adjustable piece; that the bands are carefully formed, uniform in shape and size; that there is no surplus metal in them, and that the screw would break before the band would give. The screw is adjusted with a screw driver. These bands are made for hydrant, also for steam and brewer's hose, from ¼ inch to 2½ inches.

Marble Water-Closet Door Hinge Attachment.

Chicago Spring Butt Company, Union Park Place and Carroll avenue, Chicago, Ill., are offering the above attachment, as illustrated herewith. The attachment is made for the hinges and blanks of the Chicago spring butts, so that a door may be hung with a pair of hinges; or with a



Marble Water-Closet Door Hinge Attachment.

hinge and blank, when one hinge is strong enough to open the door. As the doors are of wood it requires the attachment only for the marble partitions, the hinge being attached to the wood door, as in ordinary cases. The attachments are made in sizes corresponding to their various sized spring butts, and are supplied in brass or bronze metal, and in finish to match other manufacturers' goods. The point is made that though the attachments are more suited to the Chicago spring butts, they can be used with other makes, by drilling the screw holes in them to match those in the attachment.

The establishment of two new transatlantic lines this season, one from Rotterdam and the other from Stettin, the latter with Gothenburg connections, will add important trade facilities.

Waverly Scorcher.

The machine illustrated herewith is being introduced by the Indiana Bicycle Company, Indianapolis, Ind. The material used in the construction of the wheel is described by the manufacturers as being of the best grade throughout; imported seamless steel tubing for frame and forks, drop steel forgings for all the solid parts, piano wire for spokes, imported Swedish steel for the rims, while the bearings are turned up from tool steel. The bicycle is being put on the market by the manufacturers as a strictly high-grade machine in every particular, at a list price lower than is usual for a wheel of this class. The above company state that they have a capacity for building 40,000 machines per year.

Waverly Scorcher.

Flat-Keyed Automatic Padlock.

Miller Lock Company, Frankford, Philadelphia, Pa., are introducing the lock of which a full-size cut is herewith shown.

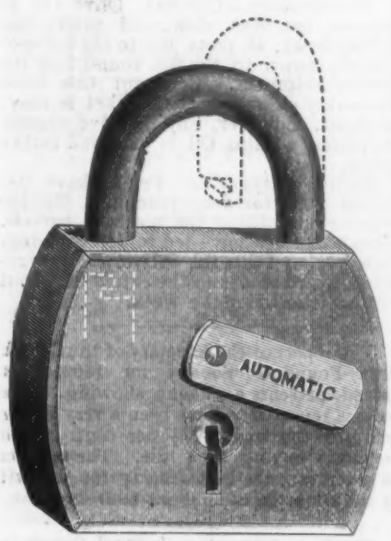


Fig. 1.—Flat-Keyed Automatic Padlock.

Upon turning the key, as illustrated in Fig. 2, for unlocking, the shackle springs around at right angles to the lock. In locking, the shackle is turned to its original position, when it springs down in place, automatically fastening the lock. The locks weigh about ¼ pound, and each has four levers, with 168 changes available. The locks may be ordered in sets, special to pass a sample key, keys alike to pass, or with more than 50 changes. The locks are made in steel, dark finished,

Fig. 2.—Key for Automatic Lock.

with two keys, No. 406; also in brass, bright finished, with two keys, No. 407.

Housewives' Delight Can Opener.

The accompanying cuts illustrate a can opener being put on the market by F. E. Kohler & Co., Canton, Ohio. It is described as being made from the best malleable iron, with steel knives adjustable to any size of can, and as cutting smoothly and without exertion. It combines openers suitable for round and square cans with a skewer puller, as shown in Figs. 1, 2 and 3.

Fig. 1.—Housewives' Delight Can Opener.

The Clinton Wire Cloth Company, Clinton, Mass., have a new mill in which they are putting looms for weaving Window Screen Cloth. The company have recently increased the force in the machine shop to upward of 30 men, who are now busily engaged in getting out the new looms. The estimated increase in production will exceed 10,000,000 square feet per annum. We are also advised that the Westinghouse Company of Boston are putting in the works two dynamos by which the seven mills will be equipped with incandescent lights. The company are running double turn in several of their mills and on the fine weaving a very steady light is necessary, for if a wire breaks it must be seen instantly or the fabric weaving is liable to be ruined.

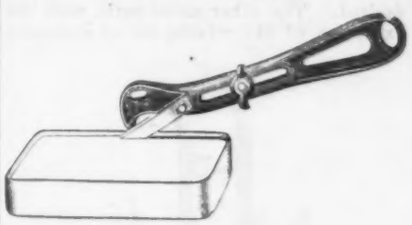


Fig. 2.—Adapted to Square Cans.

The Keystone Mfg. Company, 312 Terrace, Buffalo, N. Y., in their advertisement in this issue illustrate the Nonpareil Ratchet Wrench, which is described as made of the best forged tool steel. These Wrenches can be made reversible instantly without removing from the work by throwing over the lever in slot of the handle.

Fig. 3.—As Skewer Puller.

Famous Parer and Slicer.

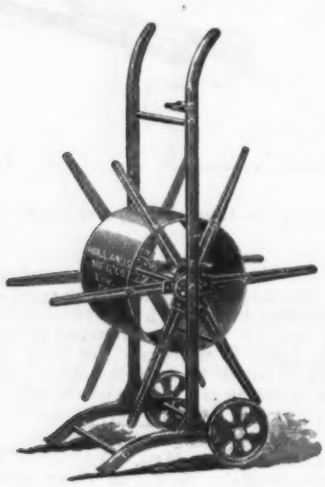
The paring and slicing knife which the accompanying cut illustrates is being introduced by Charles F. Spery, Herman, Mo. The knife is made of one piece of refined steel, providing two blades, one for cutting and the other for paring and slicing. The point of the knife is designed to remove the eyes of potatoes and the side of the blade to remove the decayed parts of fruits or vegetables. The point is made that the construction of the blade enables following the curves or uneven surfaces of

Famous Parer and Slicer.

the fruits or vegetables upon which it is used, as well as straight surfaces. The maker claims that by the use of the knife 5 to 10 per cent. of the peel is saved, and equally as much time; that the forefinger is not made callous or the thumb cut; that an even peel is taken off and that the blade is easily cleaned. It is designed for use on potatoes, carrots, parsnips, turnips, squash, apples, pears, quinces and firm peaches.

Metal Hose Reel.

The accompanying cut represents a reel manufactured by The Hollands Mfg. Company, Erie, Pa. The cylinder is made of heavy galvanized sheet iron, and is provided with an automatic attachment which allows it to revolve or to remain fixed, as desired. The other metal parts, with the exception of the wheels, are of malleable



Metal Hose Reel.

iron, designed for rough usage. There is a nozzle holder attached to one of the handles, in connection with which is a spring for holding the hose firmly in place. The wheels are made larger than shown in the cut, to allow them to run freely and easily over lawns and walks. We are advised that the reels are painted and varnished in an attractive manner. Accommodation is provided by the reel for 150 feet of garden hose.

Mr. Powderly apprehends that the decision of the judges in Toledo and New Orleans will "revolutionize the labor movement and make necessary a complete change of tactics." He thinks that a policy more peaceable than strikes would be more effective.

Paints and Colors.

It should be understood that the prices quoted in this column are strictly those current in the wholesale market, and that higher prices are paid for retail lots. The quality of goods frequently necessitates a considerable range of prices.

Although not as large in volume as might be expected, the distribution of most lines of Paints and Colors is quite brisk and indicative of a good average trade for the season. Local and nearby demand has figured with particular prominence, being to all accounts heavier than at any previous time since the opening of the season, but country orders make a very good showing, all told. In prices no radical changes have taken place, but slight irregularities on some of the more staple goods still exist, and the market is hardly as firm as could be desired, despite the good volume of business passing. Thus far, however, the movement of prices has been within narrow bounds, and most conspicuous in the instance of low grade products.

White Lead.—Good orders have been secured for popular brands of pure pigment, and the sale of the cheaper varieties is represented as being fully up to expectations, making in all a liberal volume of business. Demand keeps up well, particularly from city and nearby trade, and the appearances are that, while somewhat tardy in developing, the spring season movement will make a bright showing. "Outside" corroders in the West and in New England are still rather aggressive, but the "trust" prices are not cut to a greater extent than about ¼ cent per pound, and then chiefly in territory where the "outside" competition is keenest. Mixed Leads of the better class hold their own in the current movement and remain quite steady as to price, while the inferior descriptions, used chiefly for sizing, seem to fare very well.

Red Lead and Litharge.—For high grade product employed in the Paint trade there is still a good steady demand, and the common grade used by Glassmakers and in other manufacture meets with full movement. Prices stand about the same as they have been for a month or six weeks past.

Zincs.—List prices for American Oxide have undergone no change, and quantity discounts are unaltered. Some reports have it, however, that the market is not as steady as surface appearances would indicate. In fact, it is rumored that small orders have been taken at the minimum price generally quoted for 10-ton lots. In foreign brands there is little doing outside of the routine distribution, and prices remain without decided change, although rather weak in the instance of the cheaper varieties that come in closest competition with domestic product.

Colors, &c.—For the general line of Dry Colors there has been a good seasonable demand. Competition keeps prices low and somewhat irregular, but no radical changes are reported for the past week. Oil Colors are in about the same position. Ready-mixed Paints are moving out quite freely, and the volume of business is fully up to the spring season average.

Oils and Turpentine.

The most prominent feature has been a further sharp decline in price of Lard Oil, due to lower market for raw material. This, in turn, has operated to weaken the market for competing products, and, along with depression in the market for Greases generally, has served to weaken Cotton-Seed Oils. At present the situation in the several lines is very unsettled, and business is held in abeyance to greater or less extent pending developments. In Oils not directly affected by the conditions above outlined, there have been few and only unimportant changes, but business is rather slow in nearly all departments, and hardly in line with the usual volume for this season of the year.

Linseed Oil.—There has been a good steady demand, and, in contrast with the experience in several other lines of Oils, the distribution is running quite as full as usual at this season of the year. In fact, most reports are to the effect that sales have been heavier the past week than at any time since the spring season opened. Competition is temperate at the moment, and prices therefore remain very steady, although the market for Seed has weakened considerably.

Cotton Seed Oils.—Dealings in both Crude and Refined product have been on a very moderate scale. There is little, if any, export interest, speculation is lifeless, and, being well stocked, large consumers are extremely indifferent. Values, naturally, are somewhat depressed, but no decided changes have taken place except on "off"-grade product, the supply of which appears to be comparatively large. The difference between prices for the latter and for prime quality are as great as 6¢ @ 8¢ per gallon, against a customary margin of 2¢ @ 3¢, indicating a particularly poor market for the inferior product.

Lard Oil.—City pressers have dropped their price for prime quality Oil to 87¢, and sellers of out-of-town products have made a similar reduction. The decline is due chiefly to lower cost of raw material, but lack of orders and consequent accumulation of supplies, due to extremely high prices, is not without some bearing on the market. Current quotations are comparatively high, but closer to actual cost than prices have been for some time past.

Fish Oils.—There has been little movement in Crude, Sperm, Whale or Menhaden Oil, and the position of the market for the goods is unchanged. The manufactured products are selling to quite the average extent in ordinary jobbing parcels and command full former prices. Cod Oils are in very firm position but not quoted higher.

Red Oils.—For these goods the demand has been very slow, and the market is at present in somewhat uncertain condition, being affected more or less by the irregularity in the market for other soap-making material.

Miscellaneous.—Common Olive Oil in barrels has been slow, and prices are rather weak, at from 63¢ to 64¢ for spot parcels, down to 60¢ for round lots for future shipment. Cocoanut Oils have been very slow and the market is easy, without, however, any positive change in prices. Palm Oil is dull and rather weak.

Spirits Turpentine.—Prices have declined still further, reaching 33¢ for regular and 33½¢ for machine barrels. Cheaper prices have led to freer buying, however, and liberal deliveries have reduced yard stocks to the extent of about 650 barrels during the week.

The report of the secretary of the British Iron Founders' Society for 1892, just issued, presents a gloomy showing. The year is reported to have been a very trying one for the trade, 18½ per cent. of the members having been idle. The opinion is given that the best remedy for the evil is the adoption of an eight-hour day.

The New Jersey Iron & Steel Company of Trenton, N. J., are just completing four 440-feet spans, double track, for the Bellefontaine bridge over the Missouri river, near St. Louis. Shipment will be completed within three weeks, and it is expected that the bridge will be open for traffic next fall.

Current Hardware Prices.

APRIL 5, 1893.

Note.—The quotations given below represent the Current Hardware Prices which prevail in the market at large. They are not given as manufacturers' prices, and manufacturers should not be held responsible for them. In cases where goods are quoted at lower figures than the manufacturers name, it is not stated that the manufacturers are selling at the prices quoted, but simply that the goods are being sold, perhaps by the manufacturers, perhaps by the jobbers at the figures named.

The character @ is used to indicate a range of price; thus discount 50&10@50&10&5 % signifies that the goods in question are sold at prices ranging from discount 50 and 10 % to discount 50 and 10 and 5 %.

Adjusters, Blind—

Domestic.....₩ doz $3.00, 33⅓%
Excelsior....₩ doz $10.00.....50&10&2%
North's.....list net @ 10%
Zimmerman's—See Fasteners Blind.

Ammunition—See *Caps, Cartridges, Shells, &c.*

Anvils—

Eagle Anvils, ₩ ℔ 9¢.....15@15&5%
Peter Wright's.....11@11½%
Armitage's Mouse Hole.....10½@11½
Am. Wrought, Horse shoe brand..11@11½
Trenton.....10@10½¢
Wilkinson's.....10½@11¢
Barnes Mfg. Co.....33⅓%

Anvil Vise and Drill—

Millers Falls Co., $18.00.....30%
Cheney Anvil and Vise.....25%
Allen Anvil and Vise $3.00.....40&10%
Star.....45&5%

Apple Parers—See *Parers Apple, &c.*

Augers and Bits—

Common Augers and Bits.....70%
Boring Machine Augers.....70%
Car Bits, 12-in. twist.....50%
Russell Jennings' Augers and Bits.25&10%
Jennings' Pattern Car Bits.....40%
Jennings' Pattern Auger Bits.....60%
Snell's Bits.....60&5%
C. E. Jennings & Co., No. 10, extension lip.....40%
C. E. Jennings & Co., No. 30.....60%
C. E. Jennings & Co., Auger Bits, ₩ set, 32⅓ quarters, No. 5, $5; No. 30, $3.50.25%
Lewis' Patent Single twist.....45%
Pugh's Black.....20%
Pugh's Jennings Pattern.....30%
L'Hommedieu Car Bits.....15&10%
Forstner Pat. Auger Bits.....15%
Cincinnati Bell-Hangers' Bits.....30&10

Bit Stock Drills—

Morse Twist Drills.....50&10&5%
Standard.....50&10&5%
Cleveland.....50&10&5%
Syracuse, for metal.....50&10%
Syracuse, for wood (wood list).30@30&5%
Cincinnati, for wood.....30&10%
Cincinnati, for metal.....45&10%

Expansive Bits—

Clark's small, $18; large, $26..35@35&10%
Ives' No. 4, ₩ doz. $60.....40%
Swan's.....40%
Steer's, No. 1, $25; No. 2, $15.....35&40%
Stearns' No. 2, $48.....20%

Gimlet Bits—

Common.....₩ gross $2.75@3.25
Diamond.....₩ doz $1.25.....40&10%
Bee.....25@25&5%
Double Cut, Shepardson's.....45@45&10%
Double Cut, Ct. Valley Mfg. Co.....30&10%
Double Cut, Hartwell's, ₩ gro., $5.00..25%
Double Cut, Douglass'.....40&10%
Double Cut, Ives.....60@60&10%

Hollow Augers—

Ives'.....
French, Swift & Co. (Beecher).....
Douglass'.....
Bonney's Adjustable, ₩ doz $48.....50%
Stearns'.....20&10%
Ives' Expansive, each $4.50.....50&5%
Universal Expansive, each $4.50.....20%
Wood's.....25@25&10%
Cincinnati Adjustable.....25&10%
Cincinnati Standard.....25&10%

33⅓@33⅓&10%

Ship Augers and Bits—

L'Hommedieu's.....15&10@15&10&5%
Watrous'.....25@25&10%
Snell's.....15&10@15&10&5%
Snell's Ship Auger Patt'n Car Bits.....15&10@15&10&5%

Awl Hafts—See *Hafts, Awl.*

Awls—

Awls, Sewing, Common....₩ gr. 85¢@90¢
Awls, Should. Peg.....₩ gr. $1.50@$1.55
Awls, Pat. Peg.....₩ gr. 35¢@38¢
Awls, Shouldered Brad..₩ gr. $1.30@ 1.40
Awls, Handled Brad....₩ gr. $2.50@$3.00
Awls, Handled Scratch..₩ gr. $4.00@4.50
Awls, Socket Scratch..₩ doz. $1.10@$1.20

Awl and Tool Sets—See *Sets, Awl and Tool.*

Axes—

	Plain.	Beveled.
First quality, best brands	$7.00	$7.50
First qual., other brands	6.50 to 6.75	7.00
Second quality	5.50	6.00

Axle Grease—See *Grease, Axle.*

Axles—

No. 1....3¼@4¼¢, No. 2, 5¢@6¢
Nos. 7 to 14.....60&10%
Nos. 15 to 18.....47½%
Nos. 19 to 22.....70%
Concord Axles, loose collar.....4½@6¢
Concord Axles, solid collar.....5½@7¢
National Tubular Self Oiling.....33½@33½&5%
} 3% cash

Bag Holders—See *Holders, Bag.*

Balances—

Spring Balances.....40%

	No. 2000	20	30
Chatillon, ₩ dos.	$0.80	0.95	1.75 net

Chatillon Straight Balances.....40%
Chatillon Circular Balances.....50&10%

Barb Wire.—See *Wire, Barb.*

Bars—

Crow—

Cast Steel.....₩ ℔ 3½¢
Iron, Steel Points.....₩ ℔ 3¢

Basins, Wash—

Standard Fiberware, No. 1, 10¼-in., $1.80; 12-inch, $2.00; 13¾-inch, $2.50; 15-inch, $3.00.

Beams, Scale—

Scale Beams, List Jan. 12, '92..50&10@50&10&5%
Chatillon's No. 1.....40%
Chatillon's No. 2.....50%
Custer's.....33⅓%

Beaters—

Egg—

Dover.....₩ doz $1.00@$1.20
Duplex (Standard Co.).....₩ doz $1.00
Dover (Standard Co.).....₩ doz $1.00
Duplex Extra Heavy (Standard Co.)....₩ doz. $3.50
Bryant's.....₩ gross $14.00
Double (H. & R. Mfg. Co.), ₩ gro., No. 0 $12.00; No. 1, $15.00; No. 2.....$36.00
Easy (H. & R. Mfg. Co.).....₩ gro $12.00
Triple (H. & R. Mfg. Co.).....₩ gro $16.50
Spiral.....₩ gro $4.25 @ $4.50
Improved Acme (H. & R. Mfg. Co.).....₩ gro. $9.00
Silver & Co.....₩ doz $5.50

Culinary—

Keystone, P. D. & Co., Each, No. 1, $1; No. 2, $2.....30%

Bells—

Cow—

Common Wrought.....60&10%
Western, Sargent's list.....70&10%
Kentucky, "Star".....30&10%
Kentucky, Sargent's list.....70&10%
Kentucky Durham.....70&10%
Dodge, Genuine Kentucky....70@70&10%
Texas Star.....50&10@50&10&5%

Door—

Gong, Abbe's.....33⅓&10%
Gong, Yankee.....45&10%
Gong, Barton's.....40&10@50%
Crank, Brooks'.....50&10&2%
Crank, Cone's.....10%
Crank, Connel's.....20&10%
Lever, Sargent's.....60&10%
Lever, Taylor's Bronzed or Plated....net
Lever, Taylor's Japanned.....25&10%
Lever, R. & E. Mfg. Co.'s.....50&10&2%
Pull, Brook's.....50&10&2%

Electric—

Wollensak's.....20%
Bigelow & Dowse.....30%

Hand—

Light Brass.....70&10@70&10&5%
Extra Heavy.....70%
White.....70%
Silver Chime.....33⅓&10%
Globe Cone's Patent).....25&10@35%

Miscellaneous—

Call.....45@50%
Farm Bells.....₩ ℔ 3¢@3½¢
Steel Alloy Church and School Bells..40%

Bellows—

Blacksmiths'.....60&10&5@60&10&10%
Molders'.....40&10@50%
Hand Bellows.....40&10@50%

Belting, Rubber—

Common Standard.....70@10@75&5%
Standard.....70&5@70&10%
Extra.....60&10@60&10&5%
N.Y.B.&P. Co., Carbon.....60%
N.Y.B.&P.Co., Diamond.....50%
N.Y.B.&P.Co., Para.....40%

Bench Stops—See *Stops, Bench*

Benders and Upsetters, Tire—

Stoddard's Lightning Tire Upsetters..15%
Detroit Perfected Tire Bender.....15%
Green River Tire Benders and Upsetters.....20%

Bits—

Auger, Gimlet, Bit Stock Drills, &c., see *Augers and Bits.*

Bit Holders—See *Holders.*

Blind Adjusters—See *Adjusters, Blind.*

Blind Fasteners—See *Fasteners, Blind.*

Blind Staples—See *Staples, Blind.*

Blocks—

Cleveland Block Co., Mal. Iron..50@50&10%
Moore's Novelty, Mal. Iron.....50%
Sure Grip Steel Tackle Blocks.....35%

Bolts—

Carriage, Machine, &c.—

Com. list June 10, '84.....75&10&5@80%
Genuine Eagle, Norway, list Oct. '84.....80&5@80&10%
Eagle, Norway, list Oct. '84&80&10@80&15
Phila. pattern, list Oct. 7, '84.....80%
R.B.&W., old list.....70%
Machine, list Jan. 1, 1890.....80&10%
Bolt Ends, list Jan. 1, 1890.....80&10%

Door and Shutter—

Cast Iron Barrel, Square, &c.....70&10%
Cast Iron Shutter Bolts.....70&10%
Cast Iron Chain (Sargent's list).....65&10%
Ives' Patent Door Bolts..60&10@60&10&5%
Wrought Barrel.....70&10@75%
Wrought Square.....70&10@75%
Wr't Shutter, all Iron, Stanley's.....60&10@60&10&10%
Wr't Shutter, Brass Knob.....50@50&5%
Wr't Shutter, Sargent's list.....60&10%
Wr't Sunk Flush, Sargent's list.....60&10%
Wr't Sunk Flush, Stanley's list.50&10&5%
Wr't B. K.Flush, Common.....55&10%

Stove and Plow—

Stove.....60&10@60&10&5%
Plow.....60&10&50@60&10&10%
R. B. & W., Plow.....55%

Tire—

Common, list Feb. 28, '83.....65@65&5%
Port Chester Bolt and Nut Company:
Empire list Feb. 28, '83.....65%
Keystone, Philadel., list Oct. '84.....80%
Norway, Phila., list Oct. '84.....75%
American Screw Company
Norway, Phila., list Oct. 16, '84.....75%
Eagle, Phila., list Oct. 16, '84.....80%
Philadel., list Oct. 16, '84.....80%
Bay State, list Feb. 28, '83.....65%
R. B. & W., Philadel., list Oct. 16, '84..80%

Borers, Tap—

Common and Ring.....20&10%
Ives' Tap Borers.....33⅓&5%
Enterprise Mfg. Co.....20%
Clark's.....33⅓@35%

Borax—

Per ℔.....9½@10½¢

Boring Machines—See *Machines, Boring.*

Bow Pins—See *Pins, Bow.*

Boxes, Wagon—

Per ℔.....3¾¢

Braces—

American Bit Brace and Tool Co.
Nos. 10, 12, 20.....60&10%
Nos. 11, 21, 24, 27.....70&10%
Nos. 22, 23, 25.....60&10&5%
Nos. 13, 26, 30, 37.....70&10&5
Amidon's,
Barker's Imp'd Plain.....75&10@80%
Barker's Imp. Nickeled.....65&10@70%
Ratchet.....75&10@80%
Eclipse Ratchet.....60%
Globe Jawed.....40@40&10%
Corner Brace.....40@40&10%
Universal, 8 in., $2.10; 10 in.....$2.25
Buffalo Ball.....$1.10@$1.15
Barber s.....50&10%
Saxton's,
Barker's Imp. Polished.....75&10@80%
Barker's Imp. Nickeled.....65&10@70%
Ratchet, Polished.....50&10@60%
Ratchet, Nickeled.....40&10@50%
Buffalo Ball.....net, $1.10@$1.15
Bartholomew s,
Nos. 25, 27 and 30.....50&10@60&5%
Nos. 117, 118, 119.....70@70&5%
Common Ball, American.....$1.00@$1.10
Fray's Genuine Spofford's...50&5@50&10%
Fray's Nos. 70 to 120, $1 to 123. 207 to 414 50&10%
Ives' New Haven Novelty.....70@70&5%
New Haven Ratchet.....60&5@60&10%
Barber Ratchet.....60&5@60&10%
Barber's.....60&5%
Spofford.....60&5@60&10%
P. S. & W. Co., Peck's Patent.....60%
Rose & Johnson.....50%
Davis Patent.....50&10%

Brackets—

Shelf, plain,
Regular, list.....65@70%
Sargent's list.....60&10@70&10%
Shelf, fancy,
Sargent's list.....70@70&10%
Other makes at a wide range of prices.
Bradley Shelf Brackets.....70&10%

Bright Wire Goods—See *Wire.*

Broilers—

Henis' Self-Basting. } Inch..... 9 10 9x11
Per doz...$4.50 5.50 6.50
New Haven.....50%
Wire Goods Co.....65&10%
Morgan Odorless.....₩ doz. $12, 5%
Queen City.....33⅓%

Buckets, Well—

Galvanized—

Hill's.....₩ doz. 12 qt. $4.25; 14 qt. $5.25
Iron Clad.....₩ doz. 14 qt. $4.25@4.50
Helwig's Flat Iron Band.....$3.75
Helwig's Wired Top.....₩ doz $4.00

Bull Rings—See *Rings, Bull.*

Butcher's Cleavers—See *Cleavers Butchers'*

Brass—

Wrought Brass.....80@80&10%
Cast Brass, Tiebout's.....80%
Cast Brass, Fast.....33⅓&10%
Cast Brass, Loose Joint.....33⅓&10%

Cast Iron—

Fast Joint, Narrow.....50&10&5@60%
Fast Joint, Broad.....60&10@60%
Loose Joint.....
Loose Joint, Japanned.....
Loose Joint, Jap. with Acorns..
Parliament Butts.....
Mayer's Hinges.....
Loose Pin, Acorns.....
Loose Pin, Acorns, Japanned...
Loose Pin, Acorns, Japanned, Plated Tips.....
} 75@75 & 10%

Wrought Steel—

Fast Joint, Narrow.....
Fast Joint, Lt. Narrow.....
Fast Joint, Broad.....
Loose Joint, Broad.....
Table Butts, Back Flaps, &c.....
Inside Blind, Regular.....
Indide Blind, Light.....
Loose Pin.....
} Last Jan. 8, 1894, 60@60&10%
Bronzed Wrought Butts.....50@50&10%

Calipers—See *Compasses.*

Calks, Toe—

Gautier, One Prong, Blunt.....
Burke's One Prong, Blunt.....
Burke's, Two Prong, Blunt.....
Burke's, One Prong, Sharp.....
} 65@67½

Can Openers—See *Openers, Can.*

Cans, Milk—

S. S. & Co.: 5-gal., $2.10; 8-gal., $3.10; 10-gal., $3.35 each.....25%

Caps—

Percussion—

Hicks & Goldmark's and Union Metallic Cartridge Co.....₩ 1000
F. L. Waterproof, 1-10's.....35@37¢
E. B. Trimmed Edge, 1-10's.....47@50¢
E. B. Grnd. Edge, Cent. Fire, 1-10's.....47@50¢
Musket, Waterproof, 1-10's.....50@52¢
G. D.....27@30¢
S. B. Genuine Imported.....42¢
Eley's E. B.....50@52¢
Eley's D Waterproof, Central Fire..$1.00

Primers—

Berdan Primers, $1.00.....25
B. L. Caps (Sturtevant Shells) $1.00.....25
All other Primers, $1.20.....25

Cards—

Watson's Cotton, Wool, Horse and File, list January 28, 1891.....20%

Carpet Stretchers—See *Stretchers, Carpet.*

Cartridges—

Rim Fire Cartridges.....50&5&2%
Rim Fire Military.....15&2%
Cent. Fire, Pistol and Rifle.....25&5&2%
Cent. Fire, Military and Sporting.....15&5&2%
Blank Cartridges, except 22 and 32 cal., additional 10% to above discounts.
Blank Cartridges, 22 cal., $1.75.....25
Blank Cartridges, 32 cal., $2.50.....35
Primed Shells and Bullets.....15&5&2%
B. B. Caps, Round Ball, $1.75.....25
B. B. Caps, Con. Ball, Swgd., $2.00.....25

Carpet Sweepers—See *Sweepers, Carpet.*

Casters—

Bed.....
Plate.....
Shallow Socket.....
Deep Socket.....
Martin's Patent (Phœnix).45&10@50&10%
Tucker's Patent, low list.....45%
Payson's Anti-friction.....70@70&10%
Payson's Truck.....60@60&10%
Yale Casters, low list.....45%
Yale, Gem.....70%
Giant Truck Casters.....35%
Stationary Truck Casters.....50&10%
Socket Truck Casters.....50@50&10%
Gwinner's Common Sense.....45%
Gwinner's Hercules.....45%
} Brass.....55@55&10%
} Others.....60@60&10%

Cattle Leaders—See *Leaders, Cattle.*

Cement—

Victor Elastic.....5 ℔ pails ₩ ℔ 8¢

Chain—

Trace, Wagon and Fancy Chains, List revised Oct. 15, 1892..60@60&10%
American Coil, in cask lots.

3-16	¼	5-16	⅜	7-16	½	⅝	¾
$7.00	5.30	4.45	3.80	3.65	3.50	3.40	3.30

Less than cask lots, add ½@½¢ ₩ ℔
German Coil, list July 12, 1892.60@60&10%
German Halter Chain, list July 12, 1892. 60@60&10%
Covert Halter.....60&2%
Covert Traces.....35&2%
Covert Heel Chain.....50&2%
Galvanized Pump Chain.....(*See Trade Report.*)
Oneida Halter Chain.....60@60&10%
Jack Chain, Iron and Brass, list March 10, 1893.....50&10%
Barnes' Reinforced Sash.....60&10%
Barnes' Victor Sash.....65%

Chalk—

White, case lots. ₩ gr 50¢, small lots. 85¢
Red, case lots....₩ gr 67¢ small lots. 75¢
Blue, case lots....₩ gr 75¢ small lots 85¢
See also Crayons

Chalk Lines—See *Lines.*

Chisels—
Socket Framing and Firmer

P. S. & W. / New Haven / Witherby / Mix / Ohio Tool Co. .75&10@75&10&5%
Douglass .75@75&5%
Buck Bros. .30%
Merrill .60&10@60&10&5%
L. & I. J. White .30@30&5%

Tanged and Miscellaneous.

Tanged Firmers .50@50&10%
Butchers' .$4.75@$5.00
Spear & Jackson's .$5 to £
Buck Bros. .30%
Cold Chisels, ₩ lb .15@16¢

Chucks—
Beach Pat. .each, $3.00 .20%
Morse's Adjustable, each, $7.00 .20@20&5%
Danbury .each, $6.00 .30@30&5%
Syracuse, Balz Pat. .33⅓%
Graham Patent .33⅓%
Skinner's Patent Chucks.
Combination Lathe Chucks .33⅓%
Universal Lathe Chucks .40%
Independent Lathe Chucks .40%
Drill Chucks .15%
Union Mfg. Co.
Victor .$8.50, 25%
Combination .40%
Universal .40%
Independent .40%

Churns—
Tinn Union, each, 5 gal. $3.25; 7 gal., $3.75; 10 gal., $4.25.
McDermaid Star Barrel Churn, each 6 gal., $2.60; 10 gal., $2.75; 15 gal., $3.00; 20 gal., $3.25.

Clamps—
R. I. Tool Co.'s Wrought Iron .25%
Adjustable, Cincinnati .15&10%
Adjustable, Hammers .15@15&5%
Adjustable, Stearn's .30@30&10%
Stearn's Adjustable Cabinet and Corner .30@30&10%
Cabinet, Sargent's .70&10%
Carriage Makers', Sargent's .75@75&5%
Carriage Makers', P., S. & W Co. .40&10%
Eberhard Mfg. Co. .40@40&10%
Warner's .40&10@40&10&5%
Saw Clamps, see Vises, Saw Filers'.
Carpenter's, Cincinnati .25&10%
Barnes' Machinists' Clamps .33⅓%

Cleavers, Butchers'—
Bradley's .25@30%
L. & I. J. White .20&5%
Beatty's .40@40&5%
New Haven Edge Tool Co.'s .40%
P., S. & W .33⅓&5@33⅓&10%
Foster Bros. .30%
Schulte, Lohoff & Co. .40@40&5%

Clips—
Norway, Axle, ¼ & 5-16 .55&5&5%
2d grade Norway Axle, ¼ & 5-16 .65&5%
Superior Axle Clips .66⅔&5&70%
Norway Spring Bar Clips, 5-16 .60&5&5%
Wrought Iron Felloe Clips .₩ lb, 5½¢
Steel Felloe Clips .₩ lb, 5¢
Baker Axle Clips .25%

Cloth and Netting, Wire
—See *Wire, &c.*

Cockeyes .50%

Cocks Brass—
Hardware list .60&2%

Coffee Mills—See *Mills, Coffee.*

Collars, Dog—
Chapman Mfg. Company .50&10@60%
Medford Fancy Goods Co. .40&10@50%
Embossed, Gilt, Pope & Steven's list. .30&10%
Leather, Pope & Steven's list .40%
Brass, Pope & Steven's list .40%

Combs, Curry—
Fitch's .50&10@50&10&10%
Rubber, per doz., $10.00 .25%
American Curry Comb Co. .33⅓@40%
Kohler's Magic Oscillating. ₩ doz., $2.00
Kohler's Humane .₩ doz., $1.75

Compasses, Dividers, &c.
Compasses, Calipers, Dividers .70@70&10%
Bemis & Call Co.'s
Dividers .65%
Compasses .50&5%
Calipers, Wing and Inside or Outside .50&5%
Calipers, Double .60%
Calipers, Call's Patent Inside .30%
Excelsior .50%
J. Stevens & Co.'s .25&10%
Starrett's
Spring Calipers and Dividers .25&10%
Lock Calipers and Dividers .25%
Combination Dividers .25%

Coolers, Water—
S. S. & Co.: 2-gal., $2.30; 3-gal., $2.60; 4-gal., $3.00; 5-gal., $3.75 each .33⅓%

Coopers' Tools—
See *Tools, Coopers'.*

Cord—
Sash—

Common .₩ lb, 9@10¢
Patent, good quality .₩ lb, 11@12¢
White Cotton Braided, fair .₩ lb, 24@25¢
Common Russia Sash .₩ lb, 12½@13¢
Patent Russia Sash .₩ lb, 13½@ 14¢
Cable Laid Italian Sash .₩ lb, 19@20¢
India Cable Laid Sash .₩ lb, 11½@12¢
Silver Lake—
A quality, White, 50¢ .25%
A quality, Drab, 55¢ .25%
B quality, White, 30¢ .10%
B quality, Drab, 35¢ .10%
Sylvan Spring, Extra Braided, White .34¢
Sylvan Spring, Extra Braided, Drab .39¢
Semper Idem, Braided, White .27@28¢
Egyptian, India Hemp, Braided .26¢
Massachusetts, White .29¢
Samson—
Braided, White Cotton .₩ lb, 37¢
Braided, Drab Cotton .₩ lb, 42¢
Braided, Italian Hemp .₩ lb, 40¢
Braided, Linen .₩ lb, 56¢
Tate's Solid Braided—
Hercules, White .₩ lb, 25¢
Hercules, Drab .₩ lb, 30¢
Economy, Drab .₩ lb, 27¢
Economy White .₩ lb, 22¢
Ossawan Mills—
Braided, Giant, White, ₩ lb, 30¢ .30%
Braided Giant, Drab and Fancy, ₩ lb 35¢ .10%
Braided, Crown White, ₩ lb, 50¢ .50%
Braided, Crown Drab and Fancy, ₩ lb 56¢ .50%

Wire Picture—
Braided or Twisted .50&5@50&15%

Corkscrews—See *Screws, Cork.*

Corn Knives and Cutters
—See *Knives, Corn.*

Crackers, Nut—
Table (H. & B. Mfg. Co) .40%
Blake's Pattern, ₩ doz., $2.00 .10%
Turner & Seymour Mfg. Co. .50%
Acme.
Japanned, ₩ gro., $30 .50%
Nickel Plated, ₩ gro. $30 .10%

Cradles—
Grain .50&5&2@50&10&2%

Crayons—
White Crayons, ₩ gross .7@8¢
D. M. Stewart Mfg. Co., Metal Workers', ₩ gross, $2.50 .25%
D. M. Stewart Mfg. Co., Rolling Mill, ₩ gross, $2.50 .25%
See also *Chalk.*

Creamery Pails—See *Pails, Creamery.*

Crow Bars—See *Bars, Crow.*

Curry Combs—
See *Combs, Curry.*

Curtain Pins—
See *Pins, Curtain.*

Cutters—
Meat—

Dixon's, ₩ doz. .40&5%

Nos.	1	2	3	4
Each	$14.00	$17.00	$19.00	$30.00

Woodruff's, ₩ doz. .40&5%

Nos.	100	150
	$15.00	$18.00

Hale's Pattern, ₩ doz. .70@70&5%

Nos.	11	12	13
	$27.00	$33.00	$45.00

American .30%

Nos.	1	2	3	4	B	5
Each	$5	$7	$10	$25	$50	$80

Enterprise .25%

Nos.	10	12	22	32	42
Each	$3	$2.50	$4	$6	$15

Great American Meat Cutter .50@50&5%

Nos.	112	116	118	120	122
Each	$2.00	$2.75	$3.00	$3.50	$4.00

Miles' Challenge, ₩ doz. .45@45&10%

Nos.	1	2	3
	$22.00	$30.00	$40.00

Home No. 1, ₩ doz., $26.00 .55&10%
Draw Cut, each:

Nos.	5	2	6	8
	$50	$75	$80	$225

.20@25%
Beef Shavers (Enterprise) .20%
Little Giant (P. S. & W. Co.) .50%
Chadborn's Smoked Beef Cutter, ₩ doz., $66.00

Tobacco

Champion .20&10@30%
Ali Iron .₩ doz., $4.25
Nashua Lock Co.'s .₩ doz., $18.00, 50@55%
Wilson's .55%
Sargent's .₩ doz., $24.00, 55&10
Acme .₩ doz., $30.00, 40%

Washer—

Smith's Pat. .₩ doz., $12.00, 20&10&10%
Johnson's .₩ doz., $11.00, 33⅓%
Penny's .₩ doz., Pol. $14; Jap'd, $16, 55%
Appleton's .₩ doz., $16.00, 60&10%
Bonney's .30&10%
Cincinnati .25&10%

Dampers, &c.—
Dampers, Buffalo .40&10%
Buffalo Damper Clips .40&10%
Crown Damper .40%
Excelsior .40&10%

Diggers, Post Hole, &c.—
Samson, ₩ doz., $34.00 .25@25&10%
Fletcher Post Hole Augers, ₩ doz., $36.00, 20@20&10%
Eureka Diggers .₩ doz. $12.00@$13.00
Vaughan's Post Hole Auger, ₩ doz., $8.50@$9.50
Kohler's Little Giant .₩ doz., $18.00
Kohler's Hercules .₩ doz., $14.00
Kohler's Invincible .₩ doz., $12.00
Kohler's New Champion .₩ doz., $8.00
Scheidler .₩ doz., $18.00
Cronk's Post Bars, ₩ doz., $30.00, 50&5@50&10%
Gibb's Post Hole Digger .₩ doz., $15.00
Gibbs' National .₩ doz., $12.00
Gibbs' Columbia .₩ doz., $13.00
Gibbs' Imperial .₩ doz., $7.50
Shimer's Hollow Handle .₩ doz., $24.00, 50%

Dividers—See *Compasses.*

Dog Collars—See *Collars, Dog.*

Door Springs—
See *Springs, Door.*

Drawers.
Money, ₩ doz. .$18@$20

Drawing Knives—
See *Knives, Drawing.*

Drills and Drill Stocks—
Blacksmiths' .each $1.75
Blacksmiths' Self-Feeding, each $7.50, 20%
Breast, P. S. & W. .40&10%
Breast, Wilson's .50&5%
Breast, Millers Falls .each $3.00, 25%
Breast, Bartholomew's .each $2.50 .25&10@40%
Ratchet, Merrill's .20@20&5%
Ratchet, Ingersoll's .25%
Ratchet, Parker's .30@20&5%
Ratchet, Whitney's .20&10%
Ratchet, Weston's .20@25%
Ratchet, Moore's Triple Action .25@30%
Ratchet, Curtis & Curtis .30%
Whitneys Hand Drill, Plain, $11.00; Adjustable, $12.00 .20&10%
Automatic Boring Tools .$1.75@$1.80
Chicopee Automatic Drill .20&10%

Twist Drills—

Cleveland .50&10&10%
Diamond, W. & B. .50&10&10%
Graham's Pat. Groove Shank .50&10&10%
Morse .50&10&10%
New Process .50&10&10%
Standard .50&10&10%
Syracuse (Mem list) .50&10%

Drill Bits or Bit Stock Drills—See *Augers and Bits.*

Drill Chucks—See *Chucks.*

Dripping Pans—
See *Pans, Dripping.*

Drivers, Screw—
Douglass Mfg. Co. .20@20&10%
Disston's .50%
Buck Bros. .30%
Stanley R. & L. Co.'s
No. 64, Varnished Handles .65&10%
No. 86 .70&10%
Sargent & Co.'s
No. 1, Forged Blade .60&10&10%
Nos. 20, 40 and 60 .60⅔&10&10%
P. S. & W. .70%
Knapp & Cowles
No. 1 .60&20@70%
No. 2 .60&10&10@70&5%
No. 3 .60&5@60&10%
Nos. 4 and 60, Acme and Ideal .50&5@50&10&5%
Stearns' .25&10&5%
Gay & Parsons .35%
Champion .25&10%
Clark's Pat. .30@33⅓%
Crawford's Adjustable .30%
Ellrich's Socket and Ratchet .25@25&10%
Allard's Spiral, new list .25%
Kolb's Common Sense .₩ doz., $6.00, 25&10%
Syracuse Screw-Driver Bits .30&30&5%
Screw Driver Bits .₩ doz., 50@75¢
Screw Driver Bitts, Parr's .₩ gross, $6.25
Fray's Hol. H'dle Sets .No. 3, $12.00, 45%
P. D. & Co.'s All Steel .50%
Cincinnati .25&10%
Brace Screw Drivers .25&10%
Buck Bros.' Screw Driver Bits .27½&5%
Goodell's Automatic .50%
Mayhew's Black Handle .50%
Mayhew's Monarch .45&10%
C. T. Williamson Wire Novelty Co. .50%

Egg Beaters—See *Beaters, Egg*

Egg Poachers—
See *Poachers, Egg.*

Electric Bell Sets—
See *Bells, Electric.*

Emery—No. 4 to No. 54 to Flour, CF.

	46 gr.	150 gr.	F.FF.
Kegs, ₩ lb	4½¢	5 ¢	2½¢
½ kegs, ₩ lb	4¾¢	5¼¢	2¾¢
¼ kegs, ₩ lb	5 ¢	5½¢	3 ¢
10-₩ cans, 10 in case	6 ¢	6½¢	5 ¢
10-lb cans, less than 10	10 ¢	10 ¢	7½¢

Enameled and Tinned Ware—See *Ware, Hollow.*

Escutcheon Pins—
See *Pins, Escutcheon.*

Escutcheons—
Door Lock .Same dis. as Door Locks.
Brass Thread .60@60&10%
Wood .25%

Expanded Metal—
List No. 5.
Lathing .10%
Fencing, Painted Sheets .20%
Netting, Painted Sheets .20%
Door Mats, Galvanized .25%
Window Guards, Paneled .15%
Tree Guards, Paneled .15%

Extractors, Lemon Juice
—See *Squeezers, Lemon.*

Fasteners, Blind—
Mackrell's, ₩ doz., $1.00 .20@20&10%
Van Sand's Screw Pat, $15 ₩ gr. .60&10%
Van Sand's Old Pat., $15 ₩ gr. .55&10%
Austin & Eddy No. 2008 .₩ gr., $9.00
Security Gravity .₩ gr., $9.00
Zimmerman's .50&10%

Faucets—
Fenn's .40%
Fenn's Cork Stops .33⅓%
Star .60%
Frary's Pat. Petroleum .60%
B. & L. B. Co.
West's Lock, Open and Shut Key .50%
Star, Metal Plug, new list .40%
Lockport, Metal Plug, reduced list .60%
Metallic Key, Leather Lined .60&10@
Cork Lined .60&10&10%
Burnside's Red Cedar .70&5@70&10%
Burnside's Red Cedar, bbl. lots .50%
Burnside's Red Cedar, bbl. lots .50&10%
John Sommers'
Peerless Best Block Tin Key .40%
IXL, 1st quality, Cork Lined .50%
Diamond Lock .40%
Perfection, Fla. Red Cedar (in boxes) .40%
Boss Metallic Key .50%
Reliable Cork Lined .60%
O. K. Western Pattern Cork Lined .50%
No Brand, Red Cedar (in bbls.) .50&10%
Western Pattern Metal Key .40%
No Brand Metal Key .60%
Self Measuring
Enterprise, ₩ doz., $36.00 .20%
Lane's ₩ doz., $36.00 .25&10%

Felloe Plates—
See *Plates, Felloe.*

Fibre Ware—See *Ware, Fibre.*

Fifth Wheels—
Derby and Cincinnati .45&5%
Brewster .50&5%

Files—
Domestic—

Nicholson Files, Rasps, &c. .60&10&5@60&10&10%
Nicholson (X.F.) Files .25%
Nicholson's Royal Files (Seconds) .75% (extra prices on certain sizes.)
American .66⅔&10@66⅔&10&5%
G. & H. Barnett (Black Diamond) .60&10@60&10&5%
Arcade .60&10&10@70%
Eagle .60&10&10@70%
Other makers, best brands .60&10&5@70%
Fair brands .70@70&10%
Second quality .75@75&10&5%
Heller's Horse Rasps .50&7½@50&10%
McCaffrey's Horse Rasps .50&10%
Chelsea Horse Rasps, Hand Cut .50&10%
Arcade Horse Rasps .60&10@60&10&5%
Trojan Horse Rasps .60&10&5%

Imported—

Butcher .Butcher's list, 20%
Stubs .Stubs list, 25@30%

Fixtures, Grindstone—
Sargent's Patent .70&10%
Reading Hardware Co. .30&10%
P., S. & W. Co. .50&10%

Fluting Machines—
See *Machines, Fluting.*

Fluting Scissors—
See *Scissors, Fluting.*

Fodder Squeezers—
See *Squeezers, Fodder.*

Forks—
Hay, Manure, &c. Asso. List, 70@70&5&2%
Hay, Manure, &c., Phila. List, 60@60&10&2%
Plated, see Spoons.

Frames—
Saw—

White Vermont .₩ gro., $9.00@$10.00
Red, Polished and Varnished .₩ doz., $1.50, 25%

Screen, Window and Door—
Porter's Pat. Window and Door Frame, 33⅓&10%
Warner's Screen Corner Irons .33⅓&10%
Stearns' Frames and Corners .25@25&10%
Cortland .40@40&5

Freezers, Ice Cream—
White Mountain .60@60&5%
Granite State .65@65&5%
Arctic .70@70&5%
American .60%
Buffalo Champion .65@65&5%
Shepard's Lightning .65@65&5%
Gem .60%
Blizzard .70%
Double Action Crown .60%
Crown .60%
Star .60%
Peerless .60&10%
Giant .60%
Zero .60&10&10%
Boss and Pet .60&10&10&10%
Keystone, P., D. & Co., each, $1.50 .20%
Standard .60@60&5%
Standard Double Action .60@60&5%
Expert .65@65&5%
Model .60@60&5%
Confectioners' Machine .50%

Fruit and Jelly Presses—
See *Presses, Fruit and Jelly.*

Fry Pans—See *Pans, Fry.*

Funnels—
Gersdorff's Perfection, Standard and Globe: Tin, 1 gro., 10%; 2 to 5 gro., 20%; 5 to 10 gro. .30%
Copper, 1 to 6 doz., 15%; 6 to 12 doz., 20%; over 12 doz. .25%

Furnaces, Soldering—
Burgess No. 3 Gem tin reservoir .$7.00
Burgess No. 3 Gem, Copper reservoir .$8.50
Clayton & Lambert No. 1 Fire-Pot, complete .$6.00

Fuse—Dis. 12½@15%. ₩ 1000 ft.
Common Hemp Fuse, for dry ground .$2.70
Common Cotton Fuse, for dry ground .2.85
Single Taped Fuse, for wet ground .3.85
Double Taped Fuse, for very wet gr. .4.80
Triple Taped Fuse, for very wet gr. .5.60
Small Gutta Percha Fuse, for water .7.50
Large Gutta Percha Fuse, for water .12.00

Gates Molasses—
Stebbin's Pattern .60@60&5%
Stebbin's Genuine .60&10&10%
Stebbin's Tinned Ends .40&10%
Lincoln's Pattern .70@70&10%
Weed's .20&10%
Boss, ₩ doz.:
No. 1, $7; No. 2, $8; No. 3, $9; No. 4, $10 .60&10&10%

Gauges—
Marking, Mortise, &c. .60&10%
Starrett's Surface, Center and Scratch. .25&10%
Stanley R. & L. Co.'s Butt and Rabbet Gauge. .20&10%
Barrett's Comb. Roller Gauge .₩ doz $8.00@$8.50
Hoague & Peck's Champion Gauge—
With Scale .₩ doz., $5.00
Without Scale .₩ doz., $4.00
Wire, Wheeler, Madden & Co. .10%
Wire, Morse's .25%
Wire, Brown & Sharpe's .10@20%
Wire, P., S. & W. Co. .10&10%

Gimlets—
Nail and Spike .50&10&5%
Eureka Gimlets .60&10%
Diamond Gimlets .₩ gr $5.00
Double Cut, Shepardson's .45@45&5%
Double Cut, Ives' .60@60&5%
Double Cut, Douglass' .40&10%

Glue—
Le Page's Liquid .25@25&5%
Upton's Liquid .25%
Improved Process .25@25&5%
Dodd's Liquid Glue .25@25&5%

Glue Pots—See *Pots, Glue.*

Grease, Axle—
Fraser's .Keg ₩ lb 4¢, Pail ₩ lb 5¢
Fraser's, in boxes .₩ gr $9.50
Dixon's Everlasting, in bxs. .₩ doz 1 lb $1.20; 2 lb $2.00
Dixon's Everlasting .10-lb pails, ea. 85¢
Lower grades, special brands.
₩ gr $5.50@$7.00
Axleine, tin boxes .₩ gross $12.00
English Coach, wooden boxes .₩ gross $5.50
English Coach, 5-lb tin pails .₩ doz. $3.50
Tiger, wooden boxes .₩ gross $7.00
Tiger, 5-lb tin pails .₩ doz $2.85

Grindstones—
Small, less than car load lots at quarry .₩ ton $9.00@$10.00
Family, regular list .60%
Family, Cleveland Stone Co. .30%

Grindstone Fixtures—
See *Fixtures, Grindstone.*

Gun Powder—See *Powder.*

Hack Saws—See *Saws.*

Hafts, Awl—
Sewing, Brass Fer. ₩ gr .$1.75
Pat. Sewing, Short. ₩ doz. .45@50%
Pat. Sewing, Long .₩ doz $1.50
Pat. Peg, Plain Top. ₩ doz. .40@45%
Pat. Peg, Leather Top .₩ doz 43@50%

Halters—

Covert's, Rope, Jute.....60&10&10&2%
Covert's Rope, 7-16-in., Jute.....70&2%
Covert's Rope, ½-in., Hemp.....50&2%
Covert's Adj. Rope Halters.....40&2%
Covert's Hemp Horse and Cattle Tie.....50&10&2%
Covert's Jute Horse Ties.....70&2%
Covert's Jute Cattle Ties.....70&10&2%
Covert's Adj. Web Halters.....35&5&2%
Covert's Saddlery Works Halters...33⅓&5
Covert's Saddlery Works Horse and Cattle Ties.....33⅓&5

Hammers—

Handled Hammers—

Haydole's, list Dec. 1, '85.....25&10@35%
Buffalo Hammer Co.
Humason & Beckley
Atha Tool Co.
Verree.....50&10%
C. Hammond & Son.....40&10@—%
Fayette R. Plumb.
Artisans' Choice, A. E. Nail.....40&10%
Regular Y. & P., A. E. Nail.....50%
Horseshoe Turning Hammers.....50%
Other Hammers.....50&10%
Cheney's Claw.....40&10%
Cheney's Machinist's & Riveting...50&5%
Magnetic Tack, Nos. 1, 2, 3, $1.25, 1.50 & 1.75.....30&10%
Nelson Tool Works.....40&10%
Warner & Nobles, new list.....25&10
Peck, Stow & Wilcox.....35@40%
Sargent's.....40@40&10%

Heavy Hammers and Sledges—

8 ℔ and under...℔ 40¢ / 8 to 5 ℔.....℔ 36¢ / Over 5 ℔.....℔ 30¢ — 75&10@75&10 &5%
Wilkinson's Smiths.....10¼@11¢℔

Handcuffs and Leg Irons

—See *Police Goods.*

Handles—

Cross-Cut Saw Handles—

Atkins', new list.....40%
Champion.....15%
Ely's Perfection.....℔ doz., $3.00

Iron, Wrought or Cast—

Door or Thumb.

Nos.	0	1	2	3	4
Per doz.	$0.90	1.00	1.08	1.35	1.50

60&10&10%

Roggin's Latches.....℔ doz 30@35¢
Bronze Iron Drop Latches..℔ doz 70¢ net
Jap'd Store Door Handles—Nuts, $1.62; Plate, $1.10; no plate, $0.88.....net
Barn Door, ℔ doz $1.40.....10&10%
Chest and Lifting.....70@70&10%

Wood—

Saw and Plane.....40&10@50%
Hammer, Hatchet, Axe, &c.....40@40&5%
Brad Awl.....℔ gr $2.00
Hickory Firmer Chisel, ass'd..℔ gr 4.50 / Hickory Firmer Chisel, large..℔ gr 5.00 — 50%
Apple Firmer Chisel, ass'd...℔ gr 5.00 / Apple Firmer Chisel, large...℔ gr 6.00 — 40&10%
Socket Firmer Chisel, ass'd..℔ gr 3.00 / Socket Framing Chisel, ass'd.℔ gr 5.00 — 40&10%
J. B. Smith & Co.'s Pat File.....50%
File, assorted.....℔ gr 2.75 / Auger, assorted.....℔ gr 5.00 / Auger, large.....℔ gr 7.00 — 50%
Pat. Auger, Ives'.....30&10%
Pat. Auger, Douglass.....℔ set $1.25
Pat. Auger, Swan's.....℔ set $1.00
Hoe, Rake, Shovel, &c.....60@60&5%

Hangers—

Barn Door, old patterns.....70@70&5%
Barn Door, New England.....70@70&5%
Samson Steel Anti-Friction.....55%
Orleans Steel.....55%
Hamilton Wrought Steel Track.....55%
Champion.....60&10%
Climax Anti-Friction.....55%
Zenith for Wood Track.....55%
Sterling.....50&10@60%
Victor, No. 1, $15.00; No. 2, $16.50; No. 3, $18.00.....50&2%
Kidder's.....50@50&10%
Boss.....60&10@60&10&5%
Best Anti-Friction.....60&10@60&10&5%
Duplex (Wood Track).....60&10&5%
Terry's Modern.....50&10@50&10&5%
Terry's Ideal.....50&10@50&10&5%
Terry's Solid.....50&10@60%
Terry's Shield.....50&10@60%
Terry's Wrought Single Strap.....50&10%
Cronk's Patent, Steel Covered.....50&10%
Carrier Steel Anti-Friction.....50&10%
Richards'.....50@30&10%
Lane's New Standard.....50@50&5%
Lane's Standard.....50@50&10%
Lane's Parlor.....40%
Warner's Pat.....20&10&10%
Stearns' Anti-Friction.....20&10&10%
Stearns' Challenge.....25&10&10%
Cincinnati, Nos. 1, $2.25; 3, $2.50; 4, $2.50.
Paragon, Nos. 5, 5¼, 7 and 8.....20&10%
Crescent.....60@60&10%
Nickel, Steel, Nos. 0, $15; 1, $20; 2, $15. 40&10@50%
Chicago Anti-Friction.....30&10%
Star.....40&10@40&10&5%
Barry.....50%
Interstate.....50&10@60%
Pendulum, Payson's.....40@40&10%
Woody.....45%
Economy, $6.00.....50&10%
Perfection.....50&10@50&10&5%

Harness Snaps—See *Snaps.*

Hatchets—

American Axe and Tool Co.
Blood's.....
Hunt's.....
Hurd's.....
Mann's.....
Peck's.....
Underhill's..... — 40 & 10 @ 50&5%
Buffalo Hammer Co.....
Fayette R. Plumb.....
C. Hammond & Son.....
Kelly's.....
Sargent's & Co.....
P., S. & W. Co.....
Ten Eyck Edge Tool Co.....
Collins.....10%
Schulte, Loboff & Co.....50@50&5%

Hay and Straw Knives—

See *Knives.*

Hinges—

Blind Hinges—

Parker.....75&2%
Huffer.....50%
Clark's, Nos. 1, 2, 3, 5, 40 and 50..80@80&5%
Clark's Mortise Gravity.....50%
Sargent's, Nos. 1, 3, 5, 11, 12, 13..75@75&10%
Reading's Gravity.....75&10@75&10&5%
Shepard's.
Noiseless.....75&10%
Niagara.....80%
Buffalo.....80%
Clark's Genuine Pattern.....80%
O. S., Lull & Porter.....75&10%
Acme, Lull & Porter.....75%
Queen City Reversible....70&10&5@75%
Clark's, Lull & Porter, Nos. 0, 1, 1½, 2, 2½, 3.....75&10&2½%
North's Automatic Blind Fixtures, No. 2, for Wood, $9.00; No. 3, for Brick, $11.50.....10%

Gate Hinges—

Western.....℔ doz $4.20, 60@60&10%
N. E.....℔ doz $7.80, 60@60&10%
N. E. Reversible ℔ doz..$5.60, 6@60&10%
Clark's, Nos. 1, 2, 3.....60&10&5%
N. Y. State.....℔ doz $4.90,60@60&10%
Automatic.....℔ doz $12.50, 50%
Shepard's.....60&10&5%

Spring Hinges—

Geer's Spring and Blank Butts....40%
Union Spring Hinge Co.'s list, March, 1886.....20%
Barker's Double Acting.....25%
Union Mfg. Co.....25%
Bommer's.....30%
Buckman's.....15@20%
Chicago.....30%
Bardsley's Patent Checking.....15%
Acme.....30%
U. S.....25&10%
Empire and Crown.....20%
Hero and Monarch.....55%
American, Gem and Star.....20%
Oxford.....20%
Royal.....60&5%
Reliable.....50%
Champion.....60%
No. 10 Matchless.....60%
No. 25 Unbreakable.....60%
J. G. C. Covered, ℔ gro., $30.....50&5%
Samson.....60@60& ¼&
Wiles', No. 1, ℔ gro., $16; No. 2.....$13
Devore, No. 1.....℔ gro , $13.00
Rex.....℔ gro., $13.00
Freeport.....℔ gro., $12.00
New Idea Nos. 1 and 10....℔ gross $13.00
Ideal No. 3.....℔ gross $10.00
Stearns' Noiseless Floor Hinge, ℔ set, $5.00.....20&10@30%

Extra 5&10% often given.

Wrought Iron Hinges—

List February 14, 1891.
Strap and T.....50&10@50&10&5%
Corrugated Strap and T.....50&10&5%
Screw Hook and Strap.....{ 6 to 12 in., ℔ D.. 4¢ / 14 to 20 in., ℔ D..3½¢ / 22 to 36 in., ℔ D.. 3¢
Screw Hook and Eye.....{ ⅛ in., ℔ D 7¾¢ / ¼ in., ℔ D 5¾¢ / ⅜ in., ℔ D 4¾¢
Rolled Blind Hinges, Nos. 32 and 34 50&10%
Rolled Blind Hinges, Nos. 232 and 234 55&10%
Rolled Plate.....70&10%
Rolled Raised.....70&10¢
Plate Hinges "Providence" { 8, 10 & 12 in., ℔ D.....5¢ / over 12 in. ℔ D.....4¢

Hoes—

Eye—

D. & H. Scovil.....20%
Lane's Crescent, Planters' Pattern.45&5%
Lane's Razor Blade, Scovil Pattern...30%
Maynard, S. & O. Pat.....45&5%
Sandusky Tool Co., S. & O. Pat / Am. Axe and Tool Co., S. & O. Pat... — 70@70& 5%
Chattanooga Tool Co., S. & O. Pat..60& 5@60&10%
Grub.....60&10%

Handled—

Garden, Mortar, &c.....70@70&5&2%
Planter's, Cotton, &c.....70@70&5&2%
Warren Hoe.....60@60&5%
Magic.....℔ doz $4.00

Hog Rings and Ringers—

See *Rings and Ringers—*

Hoisting Apparatus—

See *Machines, Hoisting.*

Hollow-Ware—

See *Ware, Hollow.*

Holders—

Bag—

Sprengle's Pat.....℔ doz $18....90%

Bit—

Extension.
Barber's, ℔ doz $15.00.....40@40&10%
Ives, ℔ doz $20.00.....60&5@60&10%
Diagonal.....℔ doz $24.00, 40%
Angular.....℔ doz $24.00, 40&5%

File and Tool—

Bals Pat.....℔ doz $4.00, 25%
Nicholson File Holders.....20%

Hooks—

Cast Iron—

Bird Cage, Sargent's List.... / Bird Cage, Reading..... / Clothes Line, Sargent's list — 60&10&10%
Clothes Line, Reading list, 60&10@60&10&10%
Ceiling, Sargent's list.....55&10&10%
Harness, Reading list..55&10@55&10&10%
Coat and Hat, Sargent's list. 55&10@60&10%
Coat and Hat, Reading. 50&10@50&10&10%

Wrought Iron—

Cotton.....℔ doz $1.25
Cotton Pat. (N. Y. Mallet and Handle W'ks.....30%
Tassel and Picture, T. & S. Mfg.Co....50%
Wrought Staples, Hooks, &c. See Wrought Goods

Wire—

Wire Coat and Hat, Gem, list April, 1886.....60@60&10
Wire Coat and Hat, Miles, list April, 1886.....50&50&10%
Indestructible Coat and Hat...45@45&5%
Wire Coat and Hat, Standard..60@60&10%
Handy Hat and Coat.....50&10@60%
Steady Ceiling Hooks.....50&10@60%
Belt.....80&10@80&20%
Atlas, Coat and Hat.....65%
Williamson's Bird Cage Hooks, List April, 1892.....40%
Bright Wire Goods—See Wire.

Miscellaneous—

Grass, No. 2, $2.00; No. 3, $2.10; No. 4, $2.25
Nolin's Grass.....℔ doz $2.25
Bush.....55@60%
Whiffletree—Patent.....55%
Hooks and Eyes—Malleable Iron. 70@70&10%
Hooks and Eyes—Brass.....60&10&10%
Fish Hooks, American.....50%
Bench Hooks—See Bench Stops.

Horse Nails—See *Nails, Horse*

Horse Shoes—

See *Shoes, Horse.*

Hose, Rubber—

Competition.....75@75&10&5%
Standard.....60&10&10@70&10%
Extra.....60@60&10%
N. Y. B. & P. Co., Para.....25&5%
N. Y. B. & P. Co., Extra.....40@40&5%
N. Y. B. & P. Co., Dundee.....50&10@60%

Huskers—

Blair's Adjustable.....℔ gr $8.00
Blair's Adjustable Clipper.....℔ gr 7.00
Hubbard's Solid Steel.....℔ gr 4.50

Indurated Fiber Ware—

See *Ware, Indurated Fiber.*

Irons.

Sad—

From 4 to 10, at factory....℔ 100 ℔, $2.30@$2.40
Self-Heating.....℔ doz $8.00
Self-Heating Tailors'.....℔ doz $18.00
Enterprise Irons, list Jan. 17, 1893....30%
Enterprise Star Irons, list Jan. 17, '93..30%
Crown.....60&10@60&10&5%
Ideal Irons, new list...50&10@50&10&10%
Salamander Irons.....25%
B. B. Sad Irons, ℔ ℔.....3@3½¢
Chinese Laundry (N.E.Butt Co.).8½¢, 15%
New England.....5¢, 20@20&5%
Mahony's Troy Pol. Irons.....25%
Sensible, list Jan. 91.....60&10&5%
Sensible Tailor's Irons.....33⅓&5
National Self-Heating.....30%

Soldering—

Soldering Coppers.....℔ ℔ 19@21¢
Covert's Adjustable, list Jan. 1, 1886. 35&2%
Tinker's Dread. ℔ doz $1.75; ℔ gro. $18

Pinking—

Pinking Irons, ℔ doz., 55@60¢.

Jack Screws—See *Screws.*

Jacks, Wagon—

Daisy.....33⅓&5
Victor.....33⅓&5
Lockport.....40%

Kettles—

Brass, Spun, Plain, list Jan. 1, '91..25&5%
Brass, Spun, Pld.W.M.list Jan. 1, '91..20%
Stamped Brass Kettles.....℔ ℔ 21¢
Enameled and Tea—See *Ware, Hollow.*

Keys—

Lock, Ass'n list Dec. 30, 1886..65&10@70%
Eagle, Cabinet, &c.....33⅓&2%
Hotchkiss' Brass Blanks.....40%
Hotchkiss' Copper and Tinned.....40%
Hotchkiss' Pad. and Cab.....35%
Wollensak Tinned.....50&10%

Knife Sharpeners—

See *Sharpeners, Knife.*

Knives—

Butcher, Shoe, &c.

Wilson's Butcher Knives, List Dec 3, 1890.....25%
Ames' Butcher Knives.....25%
Foster Bros.' Butcher, &c.....40%
Jordan's AA A1 Butchers', list.....net
Nichols' Butcher Knives.....40&10%
W. W. Wilson, Butcher, 6 in., $2.00; 7 in., $2.70; 8 in., $3.80, &c.
Ames' Shoe Knives.....20@25%
Ames' Bread Knives, ℔ doz $1.50, 15@20%
Moran's Shoe and Bread.....20@20&10%
Hay and Straw—See Hay Knives.
Table and Pocket—See Cutlery.

Corn—

Bradley's.....10%
Wadsworth's.....35@35&10%

Drawing—

Witherby..... / P., S. & W..... / Mix..... / New Haven..... — ...75@75&10&5%
Merrill.....60&10@60&10&5%
Douglass.....75&75@5%
Watrous.....15&10@35%
L. & I. J. White.....30&5%
Bradley's.....35%
Adjustable Handle.....25@25&5%
Wilkinson's Folding.....35@35&5%

Hay and Straw—

Lightning, from jobbers....$8.00@$9.00
Wadsworth's.....40&7½&10&10%
Carter's Needle....℔ doz. $11.00@$11.50
Heath's.....℔ doz. $13.00@$13.50
Nolin's Hay..℔ doz. $7.00@$8.00%

Mincing—

Am. (2d quality), ℔ gr., 1 blade, $7 2 blades, $12; 3 blades, $18.....net
Lothrop's.....20&10%
Smith's, ℔ doz., Single, $2; Double $3 40&50%
Knapp & Cowles.....50&10@60%
Buffalo Adjustable....℔ doz. $3.00, 33⅓&5

Knobs—

Door, Mineral.....60@65%
Door, Por. Jap'd.....70@75%
Door, Por. Nickel.....$2.00@$2.25
Door, Por. Plated Nicke..l....$2.00@$2.25
Drawer, Porcelain.....60&10@60&10&10%
Hemacite Door Knobs.....40&10@50%
Yale & Towne Wood, list Dec., 1885...40%
Base, Rubber Tip.....70&10&5%
Picture, Judd's.....60&10&10@70%
Picture, Sargent's.....70&10%
Picture, Hemacite.....35&5%
Shutter, Porcelain.....65&15%
Carriage, Jap.....℔ gro 80¢, 60&10%
Bardsley's Wood Door, Shutter, &c...15%

Ladders.

Davies Extension and Single.....20&5%

Ladies—

Melting, Sargents'.....60@60&5%
Melting, Reading.....35&10%
Melting, P., S. & W.....35&10@40%
Melting, Warner's.....30%

Lanterns—

Tubular—

Regular, with Guard.....℔ doz $6.50
O. K., with Guard.....℔ doz $2.75
Side Lift, with Guard.....℔ doz $4.00
Square Lift, with Guard.....℔ doz $4.25
Anti-Friction, with Guard....℔ doz $4.50
Brass Plated, Sq. Lift, Guard.℔ doz $5.50
Cop. Plated, Sq. Lift, Guard..℔ doz $6.50

Bull's Eye Police—

2¼-inch regular.....℔ doz $2.60
3-inch regular.....℔ doz $3.90
2¼-inch flash light.....℔ doz $4.00
3-inch flash light.....℔ doz $4.50

Lawn Mowers—

See *Mowers, Lawn.*

Leaders, Cattle—

Humason, Beckley & Co.'s.....70%
Sargent's.....70&10@70&10&10%
Hotchkiss.....30%
Peck, Stow & W. Co.....60&10%

Lemon Squeezers—

See *Squeezers, Lemon.*

Lifters, Transom—

Wollensak's:
Class 3 and 4, Bronzed Iron.....60%
Class 3 and 4, Bronze Metal.....50%
Class 3 and 4, Brass.....30%
Skylight Lifters.....35%
Reliers, list Feb. 20, 1891
Bronzed Iron Rods.....60@60&10%
Brass, Real Bronze or Nickel Plate..30%
Excelsior.....50&10&5%
Shaw's.....50&10%
Payson's:
Universal.....60%
Solid Grip.....60&10@60&10&10%
Imperial.....50&10%

Lines—

Cotton and Linen Fish.....50%
Chalk.....60%
Masons' Linen, 84 ft., No. 1, $1.25; No. 2, $1.75; No. 3, $2.25; No. 4, $2.75; No. 5, $3.25.....35%
Cotton Chalk.....55%
Samson Cotton, No. 4, $2; No. 4½, $2.50; 10%
Silver Lake, Braided No. 0, $6.00; No. 1, $6.50; No. 2, $7.00; No. 3, $7.50 ℔ gro.....35%
Mason's Linen, No. 3½, $1.50; No. 4, $2.00; No 4½, $2.50.
Mason's Colored Cotton.....45%
Wire Clothes..Nos. 18 19 20
100 ft.....$3.50 $3.00 $2.50
Ventilator Cord, Samson Braided, White or Drab Cotton..℔ doz $7.50...20%
Ossawan Mills, Chalk, Twisted, 60%; Chalk, Soft Braided, 50% Chalk, Braided, 25%.

Links, Open—

Terry's—per gro.:

Nos.	1	2	3	4
	$6.00	8.00	12.00	16.00

Locks, &c.—

Cabinet—

Eagle, Gaylord Parker and Corbin... / Deitz, Nos. 36 to 39..... / Deitz, Nos. 51 to 63..... / Deitz, Nos. 87 to 96..... — List March, '84, rev. Jan. 1, '85.33⅓&2%
Champion Night Latches.....40%
Barnes Mfg. Co.....40@40&10%
Eagle and Corbin Trunk.....35&10%
Champion Cab. and Combin.....33⅓&5
Yale.....net prices
Romer's.....30%

Door, Locks, Latches, &c.—

R. & E. Mfg. Co., list Mar.20, 1889..... / Mallory, Wheeler & Co., list July, '88..... / Sargent & Co., List Aug.1,'88 / Branford Lock Works — 65&10@70% Much lower net prices often mad

Brittan, Graham & Mathes, list Jan. 1890.....60&10&10%
Plate.....33⅓&2%
Barnes Mfg. Co.....40@40&10%
Yale.....net prices
Deits Flat Key.....30%
Romer's Night Latches.....15%
Brooklyn Latches.....50&10%
Warner's Burglar Proof. ₩ dos. $3.00, 50%

Padlocks—

List June 10, 1891.....50&2%
Norwich Lock Mfg. Co., old list.....50&2%
Yale Lock Mfg. Co.'s.....net prices
Eagle.....40%
Eureka, Eagle Lock Co.....40&2%
Romer's Nos. 0 to 91.....30%
Romer's Scandinavian, &c., Nos. 100 to 606.....15%
A. E. Deitz.....40%
Champion Padlocks.....40%
Hotchkiss.....30%
Star.....60%
Horseshoe.....₩ doz $9, 50@50&10%
Barnes Mfg. Co.....40@40&10%
Nock's.....30%
Scandinavian.....90&40%
E. T. Fraim's Keystone Scandinavian, Nos. 119, 120, 130 and 140.....90&10%
Other Nos.....65%
Ames Sword Co. up to No. 150.....40%
Ames Sword Co. above No. 150.....50%
Slaymaker, Barry & Co.
No. 1010 line.....90&5%
No. 41 line.....50&5%
No. 61 line.....60&5%
No. 21 line.....75&10%

Sash, &c.—

Clark's No. 1, $10; No. 2, $8 ₩ gr.....33⅓%
Ferguson's.....33⅓%
Victor.....60&10&2%
Walker's.....10%
Attwell Mfg. Co.....25&33⅓%
Reading.....66⅔&10@66⅔&10&10%
Hammond's Window Springs.....40%
Common Sense, Jap'd, Cop'd and Br'zed.....₩ gr $4.00
Common Sense, Nickel Plated. ₩ gr $10.00
Universal.....30%
Kempshall's Gravity.....60%
Kempshall's Model.....60@60&10%
Corbin's Daisy, list Feb. 15, 1886.....70%
Payson's Perfect.....60&10&10%
Hugunin's Sash Balances.....25&5&2%
Hugunin's New Sash Locks.....25&5&2%
Ives Patent.....60&10&5@60&10&10%
Fish (Liesche's pat.), No. 100, ₩ gr., $8; No. 105, ₩ gr., $10.....50%
Davis, Bronze, Barnes Mfg. Co.....60%
Champion Safety list January, 1893.70&5%
Security.....70%
Giant, list Jan., 1892.....70&5%
Wolcott's.....60&10&5%
Monarch.....50%

Lumber Tools—

See *Tools, Lumber.*

Lustro—

Four-ounce bottles.....₩ doz, $1.75; ₩ gross.....$17.00

Machines.

Boring—

	Without Augers.	Upright.	Angular.	
Douglas		$5.50	$6.75	50%
Snell's, Rice's Pat...		5.50	6.75	40&10&10%
Jennings'		5.50	6.75	45@45&10%
Other Machines..		2.35	2.75	
Phillips' Patent with Augur		7.00	7.50	
Miller's Falls		7.50		25%

Fluting—

Knox, 4¼-inch Rolls.....$3.25 each } 35%
Knox, 6-inch Rolls.....$3.60 each }
Eagle, 3¼-inch Rolls, $2.15.....35%
Eagle, 5¼-inch Rolls, $2.85.....35%
Crown, 4¼ in., $3.50; 6 in., $4.00; 8 in., $6.50 each.....35%
Crown Jewel, 6 in.....$3.50 each, 35%
American, 5 in., $3.00; 6 in., $3.40; 7 in., $4.50 each.....35%
Domestic Fluter.....each, $1.50
Geneva Hand Fluter, White Metal. ₩ doz $12, 25%
Crown Hand Fluter, Nos. 1, $15.00; 2, $12.50; 3, $10.00; 4, $8.25.....30%
Shepard Hand Fluter, No. 85, per doz $15.50.....40%
Shepard Hand Fluter, No. 110, ₩ doz $11.00.....40%
Shepard Hand Fluter No. 95, ₩ doz $8.00.....40%
Combined Fluter and Sad Iron. ₩ doz $15.00.....30%

Hoisting—

Moore's Hand Hoist, with Lock Brake.20%
Moore's Differential Pulley Block.....40%
Energy's Mfg. Co.'s.....25%
Sure Grip Steel Tackle Blocks.....35%

Washing—

Anthony Wayne, ₩ dos, No. 1, $51; No. 2, $45; No. 3, $42.
Western Star ₩ dos, No. 2, $45; No. 2 $45.
Weisell.....₩ doz $54.00
Fair and Square.....₩ doz $42.00

Mallets—

Hickory.....20&10@20&10&10%
Lignumvitæ.....20&10@20&10&10%
B. & L. Block Co., Hickory & L. V. 30@30&10%

Mattocks—Regular list, 60&10@60&10&5%

Measures—

Standard Fiberware, No. 1, peck ₩ dozen, $3.50; ½-peck, $3.00.

Meat Cutters—

See *Cutters Meat.*

Menders, Harness—

Per doz.....$2.00

Milk Cans—See *Cans, Milk.*

Mills—

Coffee—

Box and Side, List, Jan. 1, 1888. 60@60&10%
Net prices are often made which are lower than above discount.
American, Enterprise Mfg. Co., list Jan. 17, 1893.....20%
The Swift, Lane Bros.....30%

Mincing Knives—

See *Knives, Mincing.*

Molasses Gates—

See *Gates, Molasses.*

Money Drawers—

See *Drawers, Money.*

Mowers, Lawn—

Best Machines: 10-in., $4; 12-in., $4.50; 14-in., $5; 16 in., $5.50; 18-in., $6
Low-Grade Machines: 10-in. $3; 12-in., $3.25; 14-in., $3 50 each

Muzzles—

Safety.....₩ doz, $3.00, 25%

Nails.—

Cut and Wire. See Trade Report.
Wire Nails, Papered. Association list, May 1, '92. 80&10&10&5%
Tack Mfrs.' list.....70&5@70&10%
Hungarian, Finishing, Upholsterers', &c. See *Tacks.*

Horse—

	Nos. 6	7	8	9	10	
American	8¾	8¾	8¾	8¾	8¾	net
Ausable	28¢	26¢	25¢	24¢	23¢	40&10&2%
Clinton, Fin.	19¢	17¢	16¢	15¢	14¢	30&10%
Essex	28¢	26¢	25¢	24¢	23¢	40&10&5@50&5%
Lyra	19¢	17¢	16¢	15¢	14¢	40&10%
Snowden	19¢	17¢	16¢	15¢	14¢	40&10%
Vulcan	23¢	21¢	20¢	19¢	18¢	25%
Northwest'n	25¢	23¢	22¢	21¢	20¢	25@25&5%
A. C.	25¢	23¢	22¢	21¢	21¢	25&10@33⅓&5%
C. B. K.	25¢	23¢	22¢	21¢	21¢	33⅓@33⅓&10%
Maud S.	25¢	23¢	22¢	21¢	21¢	40&10&5%
Champlain	28¢	26¢	25¢	24¢	23¢	40&5&5&2%
Saranac	23¢	21¢	20¢	19¢	18¢	40&5%
Champion	25¢	23¢	22¢	21¢	20¢	10&10&10%
Capewell.	19¢	18¢	17¢	16¢	16¢	10&5%
Anchor	23¢	21¢	20¢	19¢	18¢	35%
Western	23¢	21¢	20¢	19¢	18¢	50%
Empire Bronzed						13@14 ₩ ℔

Picture—

Brass Head, Sargent's list.....60@60&10%
Brass Head, Combination list.....50&10%
Porcelain Head, Sargent's list. 50&10&10%
Porcelain Head, Combination list. 40&10%
Niles' Patent.....40%

Nail Pullers—See *Pullers, Nail.*

Nail Sets—See *Sets, Nail.*

Nut Crackers—

See *Crackers, Nut.*

Nuts—List Dec. 18, 1889.

	Square.	Hex.
Hot Pressed	5.80¢	6.50¢ off list
Cold Punched	5.00¢	5.10¢ off list

In packages of 100 ℔, add 1-10¢ ₩ ℔ net; in packages less than 100 ℔, add ½¢ ₩ ℔, net.

Oakum—

Best or Government. .....₩ ℔ 6¾@7¼¢
U. S. Navy.....₩ ℔ 5¾@6¢
Navy.....₩ ℔ 5¢@5¼¢

Oil Tanks—See *Tanks, Oil.*

Oilers—

Zinc and Tin.....65&10@70&5%
Brass and Copper.....50&10@50&10&5%
Malleable, Hammers' Improved, No. 1, $3.60; No. 2, $4.00; No. 3, $4.40 ₩ doz. 10@10&5%
Malleable, Hammers' Old Pattern, same list.....45%
Prior's Pat. or "Paragon" Zinc. 60&10&10%
Prior's Pat. or "Paragon" Brass.....50%
Olmstead's Tin and Zinc.....60%
Olmstead's Brass and Copper.....50%
Broughton's Zinc.....60%
Broughton's Brass.....50%
Steel, Draper & Williams.....50%

Openers, Can—

Messenger's Comet.....₩ doz $3.00, 25%
American.....₩ gross $2.75@$3.00
Duplex.....₩ doz 25¢, 15@20%
Lyman's.....₩ doz $3.75, 20%
No. 4, French.....₩ doz $2.25, 55@60%
No. 5, Iron Handle.....₩ gr $6.00, 45@50%
Eureka.....₩ doz $2.50, 10%
Sardine Scissors.....₩ doz $2.75@3.00
Star.....₩ doz $2.75
Sprague, No. 1, $2.00; 2, $2.25; 3, $2.50; 66⅔@70%
Excelsior, No. 1 $2.50; No. 2, $1.50.....40%
World's Best ₩ gross, No. 1, $12.00; No. 2, $24.00; No. 3, $36.00.....50&10%
Universal, ₩ doz $3.00.....55&5%
Domestic, ₩ doz $2.00.....45%
Champion, ₩ doz $2.00.....50%

Packing, Steam—

Rubber—

Standard.....70@70&10%
Extra.....60@60&5%
N. Y. B. & P. Co., Standard.....50%
N. Y. B. & P. Co., Empire.....60%
N. Y. B. & P. Co., Salamander.....25%
Jenkins' Standard, ₩ ℔ 80¢.....25@25&5%

Miscellaneous—

American Packing.....10¢@11¢ ₩ ℔
Russia Packing.....14¢ ₩ ℔
Italian Packing.....15¢@14¢ ₩ ℔
Cotton Packing.....15¢@17¢ ₩ ℔
Jute.....7¢@8¢ ₩ ℔

Palls—

Creamery—

S. S. & Co.: 18-qt., $7.00; 20-qt., $7.25 per doz 5%

Galvanized—

	Quarts	10	12	14
Hill's Light Weight, ₩ doz.	$2.75	3.00	3.25	
Hill's Heavy Weight, ₩ dz.	3.00	3.25	3.75	
Heiwig's	2.50	2.75	3.00	
Sidney Shepard & Co.	2.35	2.85	3.05	
Iron Clad	2.50	2.75	3.00	
Fire Buckets	2.75	3.25	3.50	

Buckets—See Well Buckets.

Indurated Fiber Ware—25%

Star Pails, 12 qt.....₩ doz $4.20
Milk, 14 qt.....₩ doz $5.40
Stable, 14 qt.....₩ doz $6.00
Fire Pails, deep.....₩ doz $4.80
Fire Pails, round bottom.....₩ doz $5.40

Standard Fiber Ware—

	Plain.	Deer'd
Water Pails, 12 qt., ₩ doz.	$3.60	$4.00
Dairy Pails, 14 qt., ₩ doz.	4.00	4.50
Fire Pails, No. 1, 12 qt., ₩ doz	4.00	
Fire Pails, No. 2, 14 qt., ₩ doz	4.50	
Sugar Pails.	5.50	6.00
Horse Pails	4.50	
Buggy Pails	3.50	
Slop Jars (bal. trap)	7.50	8.50
Chamber Pails, 14 qt.	6.00	7.00

Pans—

Dripping—

Small sizes.....₩ ℔ 5½¢
Large sizes.....₩ ℔ 5¢
Silver & Co. (Covered).....40%

Fry—

Standard List:	1	2	3	4
No.	0			
₩ dos.	$3.00	$3.75	$4.25	$4.75 $5.25
No.	5	6	7	8
₩ doz.	$6.00	$7.00	$8.00	$9.00

Polished, regular goods.....75@75&10%
Acme Fry Pans.....60%

Dust—

Steel Edge, No. 1.....₩ doz $1.75

Roasting and Baking—

Columbia, S. S. & Co.: Nos. 10, $2; 20, $2.25; 30, $2.50 each.....50%

Paper and Cloth—

Sand and Emery—

List April 19, 1886.....50&10@50&10&5%
Sibley's Emery and Crocus Cloth.....30%

Parers—

Apple—

Advance.....₩ doz $4.75
Baldwin.....₩ doz 5.25
Bonanza.....each 5.00
Daisy.....₩ doz 4.00
Dandy.....each 7.50
Eclipse.....₩ doz 4.25
Eureka, 1888.....each 16.00
Family Bay State.....₩ doz 12.00
Favorite.....₩ doz 5.00
Gold Medal.....₩ doz 4.00
Ideal.....₩ doz 4.00
Improved Bay State....₩ doz 27.00@30.00
Little Star.....₩ doz 4.50
Monarch.....₩ doz 13.50
New Lightning.....₩ doz 5.50
Oriole.....₩ doz 4.00
Penn.....₩ doz 4.00
Perfection.....₩ doz 4.00
Pomona.....₩ doz 4.00
Rocking Table.....₩ doz 6.00
Turn Table.....₩ doz 4.50
Victor.....₩ doz 13.50
Waverly.....₩ doz 4.00
White Mountain.....₩ doz 4.00
72.....₩ doz 4.25
78.....₩ doz 7.00

Potato—

White Mountain.....₩ doz $4.50
Antrim Combination.....₩ doz $5.50
Hoosier.....₩ doz $13.50
Saratoga.....₩ doz $5.50

Pencils—

Faber's Carpenters'.....high list 50%
Faber's Round Gilt.....₩ gro $5.25
Dixon's Lead.....₩ gro $4.50
Dixon's Lumber.....₩ gro $6.75
Dixon's Carpenters'.....10%

Picks—

Railroad or Adze Eye, 5 to 6, $12.00; 6 to 7, $13.00.....60&10@60&10&10%

Picture Nails—See *Nails, Picture.*

Pinking Irons—See *Irons, Pinking.*

Pins—

Bow—

Humason, Beckley & Co.'s.....60&10%
Sargent & Co.'s, $17 and $18.....60&10%
Peck, Stow & W. Co.....50&10@50&10&5%

Curtain—

Silvered Glass.....net
White Enamel.....net

Escutcheon—

Iron, list Nov. 11, 1885. .50&10@50&10&5%
Brass.....60@60&5%

Pipe, Wrought Iron—

List October 12, 1892.

1¼ and under, Plain.....60&10%
1¼ and under, Galv.....52½&10%
1¼ and over, Plain.....70&10%
1¼ and over, Galv.....60&10%
Boiler Tubes, list Oct. 24, 1892.....65&10%
Casing, list Nov. 16, 1892.....52½&10%
Inserted Joints Casing, list Nov. 16, 1892.....47½&5%
Steel Boiler Tubes.....27½&5%
Cold Drawn Seamless Steel Tubing..50%

Planes and Plane Irons—

Wood Planes—

Molding.....40@40&10%
Bench, First quality.....45@45&10%
Bench, Second quality.....50@50&10%
Bailey's (Stanley R. & L. Co.).....60&10%

Iron Planes—

Bailey's (Stanley R. & L. Co.).....50&10%
Miscellaneous Planes (Stanley R. & L. Co.).....25&10%
Steers' Iron Planes.....50@50&5%
Meriden Mal. Iron Co.'s.....50@50&5%
Davis' Iron Planes.....50@50&5%
Birmingham Plane Co.....60@60&5%
Gage Tool Co.'s Self-Setting.....20&10&10%
Chaplin's Iron Planes.....50@50&5%
Sargent's.....60@60&10%
Standard Tool Co.....50@50&5%

Plane Irons—

Butcher's.....$5.00@$5.25 to $
Buck Bros.....50%
Auburn Thistle, Ohio, Sandusky } .....30&10%
L. & I. J. White.....25%
Stanley R. & L. Co.....50&10%

Plates—

Felloe.....₩ ℔ 6¢@6½¢

Pliers and Nippers—

Button's Patent.....60%
Hall's No. 2, 5 in., $13.50; No. 4, 7 in., $21.00 ₩ doz.....40%
Humason & Beckley Mfg. Co..50@50&10%
Lindsay's Giant.....33⅓%
Gas Pliers.....60%
Gas Pliers, Custar's Nickel Plated..60&5%
Eureka Pliers and Nippers.....40%
Russell's Parallel.....25%
P., S. & W. Cast Steel.....50%
P., S. & W. Tinners' Cutting Nippers, add 6%.....10%
Carew's Pat. Wire Cutters.....20%
Morrill's Parallel, ₩ doz, $12.00.....60&5%
Cronk's 8 in., $15.00; 10 in., $21.00 ..... 50@50&5%
Cronk's Button Pattern.....50&10@60%
Cronk's Carrier Pliers.....60@60&5%

Plumbs and Levels—

Regular List.....75&10@75&10&5%
Stanley's Duplex.....20&10%
Stanley's Handy.....20&10%
Disston's.....50%
Cook's.....40&10%
Pocket Levels.....70&10@70&10&10%
Davis Iron Levels.....40&10%

Poachers, Egg—

Buffalo Steam Egg Poachers, ₩ dos, No. 1, $6.00; No. 2, $9.00.....33⅓%
Silver & Co., 6-Ring, ₩ dos, $4.00; 3-Ring.....$2.00

Pokes, Animal—

Bishop s I. X. L.....₩ doz $6.00
Bishop's O. K.....₩ doz $5.25
Bishop's Pioneer.....₩ doz $3.75
Bishop's American.....₩ doz $2.75
Eagle, Double Stale.....₩ doz $5.75
Eagle, Single Stale.....₩ doz $3.75
Buckeye, Single Stale.....₩ doz $2.75
Bolding.....₩ doz $6.00
Metallic Horse Poke.....₩ doz., $6.00

Police Goods—

R. I. Tool Co., Handcuffs, $15.00 ₩ doz 10%
R. I. Tool Co., Leg Irons, $25.00 ₩ doz 10%
Tower's.....25%
Daley's Improved Handcuffs; 2 Hands, Polished, ₩ doz, $48.00; Nickeled, $57.00; 3 hands, Polished, ₩ doz, $72.00; Nickeled, $84.00.....25%
J. P. Lovell's Police Goods.....25%

Polish—

Metal—

Prestoline.....30%
Prestoline Paste.....33⅓%
Gaston's Silver Compound.....33⅓%

Stove—

Joseph Dixon's.....₩ gro, $6.00, 10%
Gem.....₩ gro, $4.50, 10%
Gold Medal.....₩ gro, $6.00, 25%
Lustro.....₩ gro, $4.75
Ruby.....₩ gro, $3.75
Rising Sun, 5 gro lots.....₩ gro $5.50
Dixon's Plumbago.....₩ ℔ 8¢
Boynton's Noon Day.....₩ gro $13.00
Parlor Pride Stove Enamel, ₩ gro
Yates' Liquid, 2 3 5 10 gal
₩ gal...$0.80 .70 .60 .50
Yates Standard Paste Polish, 10 ℔ cans, ₩ ℔ 12½¢
Jet Black.....₩ gro $3.50
Japanese.....₩ gro $3.50
Fireside.....₩ gro $2.50
Diamond O. K. Enamel.....₩ gro $19.00
Bonnell's Liquid Stove Polish, ₩ gro $9.00
Bonnell's Paste Stove Polish, ₩ gro $6.00
Black Eagle Benzine Paste, 5 and 10 ℔ cans.....12½¢
Black Jack Water Paste, 5 and 10 ℔ cans.....12½¢
Nickel Plate Paste.....₩ gro $6.00
Crown Paste.....₩ gro $7.20
Crown Paste in 5 and 10 ℔ pails, ₩ ℔ 12¢
Black Flag.....₩ gro $7.20
Black Flag, 5 and 10 ℔ pails.....₩ ℔ 12¢
Black Flag, liquid, in bottles, ₩ gro $8.00
Diamond Rock Nickel Cleaner ..... ₩ gro $10.80
Raven Paste:
5-lb. pails, (per case of 6 or 12), ₩ ℔ 12¢
Less than case.....₩ ℔ 15¢
Liquid, 6 oz. bottles.....₩ gross, $3.00
Liquid, 8 oz. bottles.....₩ gross, $4.00
Water Polish.....₩ gross, $5.33

Poppers, Corn—

Round or Square, 1 qt. ₩ gr $10.00@10.50
Round or Square, 1½ qt. ₩ gr $15@$15.50
Round or Square, 2 qt. ₩ gr $18.50@19.00

Post Hole and Tree Augers and Diggers—

See *Diggers, Post Hole, &c.*

Potato Parers—

See *Parers, Potato.*

Pots—

Glue—

Tinned.....40&10@40&10&5%
Enameled.....40&10@40&10&5%
Family, Howe's "Eureka".....40%
Family, L. F. C.'s "Handy".....50%

Powder—

In Canisters—

Fine Sporting, 1 ℔ each.....$0.90
Duck, 1 ℔ each..... .80
Rifle, 1 ℔ each..... .30
Rifle, ½ ℔ each..... .15
Rifle, ¼ ℔ each..... .10

In Kegs—

Rifle, 25-℔ kegs.....$4.00
Rifle, 12½-℔ kegs..... 2.25
Rifle, 6¼-℔ kegs..... 1.25
Duck, 25-℔ kegs..... 5.00
Duck, 12½-℔ kegs..... 2.75
Duck 6¼ ℔ kegs..... 1.50

Presses—
Fruit and Jelly—
Enterprise Mfg. Co. 25%
Heals ..... ₩ doz $3.50
Shepard's Queen City 40%
Silver & Co. ..... ₩ doz $2.75

Pruning Hooks and Shears—See *Shears.*

Pullers Nail—
Scranton ..... ₩ doz., $13.00, 33⅓%
Curtis Hammer ..... ₩ doz., $9.00
Giant, No. 1 ..... ₩ doz., $18.00, 10%
Giant, No. 2 ..... ₩ doz., $15.00, 10%
Pelican ..... ₩ doz., $9.00, 25%
Eclipse ..... Each, $2.00, net
Economy ..... ₩ doz., $6.00

Pulleys—
Hot House, Awning, &c. ..... 66⅔@70%
Japanned Screw ..... 60&10&10%
Brass Screw 70%
Japanned Side ..... 60&10&10%
Japanned Clothes Line ..... 60&10%
Moore's Sash, Anti-Friction 50%
Hay Fork, Solid Eye, $4.00; Swivel, $4.50 ..... 50&10@50&10&5%
Hay Fork, "Anti-Friction," 5 in. solid, $5.70 ..... 50%
Hay Fork, "F" Common and Patent Bushed 20%
Hay Fork, Tarbox Pat. Iron 20%
Hay Fork, Reed's Self-Lubricating 60%
Shade Rack 45%
Tackle Blocks—See Blocks.
Moore's Anti-Friction 5 in. Wheel, ₩ doz., $12.00 ..... 40%
Shepard's Niagara, No. 25. ₩ doz 23¢ net
Sash (Auger Mortise).
Common Sense 60%
Empire 60%
Ideal, Nos. 2, 4, 10 & 15 / Acme / Star } 30% less 1¢ ₩ doz net.
On bbl. lots extra 5%.
Ideal, Nos. 25 and 55. .. ₩ doz. 22¢ net.

Pumps—
Cistern, Best Makers ..... 60@60&10%
Pitcher Spout, Best Makers ..... 67½@70%
Pitcher Spout, Cheaper G'ds .. 75@75&10%

Punches—
Saddler's or Drive, good .. ₩ doz., 60@65%
Bemis & Call Co.'s Cast Steel Drive. 50&5%
Bemis & Call Co.'s Springfield Socket ... 50&5%
Spring, good quality .. ₩ doz., $2.50@$2.60
Spring, Leach's Pat 15%
Bemis & Call Co.'s Spring and Check. 40%
Solid Tinners', P., S. & W. Co., ₩ doz., $1.44 ..... 55%
Tinners' Hollow Punches, P., S. & W. Co. ..... 20&2%
Rice Hand Punches 15%
Avery's Revolving 40%
Avery's Sawset and Punch—See Sawsets

Rail—
Sliding Door, Wr't Brass .. ₩ ℔, 35¢, 40%
Sliding Door, Bronzed Wr't Iron .. ₩ ft., 7¢
Sliding Door, Iron, Painted .. ₩ ft., 4¢, 40%
Barn Door, Light .. In. ¼ ⅜ ½
Per 100 feet $2.00 2.50 3.10, 10%
B. D. for N. E. Hangers—
Small. Med. Large.
Per 100 feet ..... $3.15 2.70 3.25 Net
Terry's Steel Rail ..... ₩ ft., 4½¢
Victor Track Rail, 7¢ ₩ foot ..... 50&2%
Carrier, double braced, Steel Rail, ₩ foot ..... 3½@4¢
Moore's Wrought Iron 25%
Moody Steel Rail ₩ ft., 5¢ 45%

Rakes—
Cast Steel, Association g'ds .. 70@70&5&2%
Cast Steel, outside g'ds ..... 70@70&5&2%
Malleable ..... 70@70&5%
Gibbs' Lawn Rake ..... ₩ doz., $4.90
Gibbs' Canton Lawn Rake .. ₩ doz., $3.75
Gibbs' Acme Lawn Rake .... ₩ doz., $4.75
Gibbs' Favorite Lawn Rake. ₩ doz., $3.90
Gibbs' Crown Lawn Rake, No. 1 ..... ₩ doz., $4.90; No. 2, $5.40
Oneida Lawn Rake ..... ₩ doz., $6.00
Fort Madison Prize Bow Brace and Pieces 65%
Fort Madison Steel Tooth Lawn Rake, $6.00 ..... 25%

Razors—
J. R. Torrey Razor Co 30%
Wostenholm and Butcher, $10 to £ 10%
Jordan's A.A.I, new list ..... Net
Jordan's Old Faithful, new list ..... Net
Galvanic ..... ₩ doz., $15.00
Electric Cutlery Co. ..... Net
Campbell Cutlery Co 50%

Razor Strops—See *Strops, Razor.*

Rings and Ringers—
Bull Rings—
Union Nut Co 55%
Sargent's ..... 75&10%
Hotchkiss' low list 30%
Humason, Beckley & Co.'s ..... 70&10%
Peck, Stow & W. Co.'s .. 50&10@50&10&10%
Ellrich Hdw. Co., White Metal, low list. 50@50&10%
Hog—
Top of the Hill Ringers ..... ₩ doz $2.00
Top of the Hill Rings ..... ₩ doz $1.25
Hill's Improved Ringers ..... ₩ doz $1.25
Hill's Old Style Ringers ..... ₩ doz $1.12½
Hill's Tongs ..... ₩ doz $3.00
Hill's Rings ..... ₩ doz bxs $1.00
Perfect Rings ..... ₩ doz bxs $1.50
Perfect Ringers ..... ₩ doz $2.15@2.25
Blair's Hog Ringers ..... ₩ doz $2.00
Blair's Hog Rings ..... ₩ doz 90¢@$1.00
Champion Ringers ..... ₩ doz $2.00
Champion Rings, Double ..... ₩ doz $2.25
Brown's Ringers ..... ₩ doz $2.00
Brown's Rings ..... ₩ doz $1.15@$1.25
Electric Hog Rings ..... ₩ doz boxes $1.50
Electric Hog Ringers ..... ₩ doz $2.00
Major Rings ..... ₩ doz $1.25
Major Ringers ..... ₩ doz $2.00

Rivets and Burrs—
Iron, list Nov. 17, '87 ..... 60&10@—%
Copper ..... 60@60&10%
Coppered Iron, Bettina Brand 40%

Rivet Sets—See *Sets.*

Roasting and Baking Pans—See *Pans, Roasting and Baking.*

Rods—
Stair, Brass ..... 25@30%
Stair, Black Walnut ..... ₩ doz 40¢

Rollers—
Barn Door, Sargent's list. ....60&10&10%
Acme Moore's Anti-Friction 55%
Union Barn Door Roller 70%
Thompson Mfg. Co.'s Lawn Rollers .. 30%

Rope—The following prices are f.o.b., New York or factory, and are shaded ½@1½% on large lots; terms, 1½% for cash.

Manila, 7-16 in. diam. and larger	₩ ℔	9¾¢
Manila	¾ in. ₩ ℔	10¼¢
Manila	¼ and 5-16 in. ₩ ℔	10¾¢
Manila, Tarred Rope	₩ ℔	9¼¢
Manila, Hay Rope	₩ ℔	9¼¢
Sisal	7-16 inch and larger ₩ ℔	8 ¢
Sisal	⅜ in. ₩ ℔	8¼¢
Sisal	¾ and 5-16 in. ₩ ℔	9 ¢
Sisal, Hay Rope	₩ ℔	8 ¢
Sisal, Tarred Rope	₩ ℔	7¾¢
Sisal, Medium Lath Yarn	₩ ℔	7¼¢
New Zealand	7-16 in. & larger ₩ ℔	7¼¢
New Zealand	⅜ inch, ₩ ℔	7¾¢
New Zealand	¼ and 5-16 inch, ₩ ℔	8¼¢
New Zealand, Hay Rope	₩ ℔	7¼¢
New Zealand, Tarred Rope	₩ ℔	6¾¢
Cotton Rope	₩ ℔	13½@16¢
Jute Rope	₩ ℔	6¼@7¢

Wire—
List February, 1892. All kinds 45%

Rules—
Boxwood ..... 80&10&10%
Ivory ..... 50&10%
Starrett's Steel Rules and Straight Edges ..... 25&10%

Sad Irons—See *Irons, Sad.*

Sand and Emery Paper and Cloth—See *Paper and Cloth.*

Sash Cord—See *Cord, Sash.*

Sash Locks—*See Locks, Sash.*

Sash Weights—See *Weights, Sash.*

Sausage Stuffers or Fillers—See *Stuffers or Fillers, Sausage.*

Saws—The following prices are generally cut by jobbers.

Disston's Circular ..... 45@45&5%
Disston's Cross Cut ..... 40@40&5%
Disston's Hand 25%
Woodrough & McFarlin.
Hand, Panel and Rip ..... 30@30&5%
Narrow Champion Cross Cuts with Handles, ₩ foot ..... 18@20¢
Champion Thin Back Cross Cuts, ₩ foot ..... 26@28¢
Champion Extra Thin Back Cross Cuts, ₩ foot ..... 29@31¢
One Man Champion Cross Cuts, ₩ foot ..... 37@40¢
Wheeler, Madden & Clemson Mfg. Co.
Hand, Panel and Rip ..... 35@35&5%
Narrow Champion Cross Cuts with Handles, ₩ foot ..... 18@20¢
Champion Thin Back Cross Cuts, ₩ foot ..... 26@28¢
Champion Extra Thin Back Cross Cuts, ₩ foot ..... 29@31¢
One Man Champion Cross Cuts, ₩ ft. 37@39¢
Atkins' Circular 50%
Atkins' Cross Cuts, new list 40%
Atkins' Mulay, Mill and Drag 40%
Atkins' One-Man Saw 40%
Peace Circular and Mill ..... 45@45&5%
Peace Hand Panel and Rip ..... 25@25&5%
Peace Cross Cuts ..... 45@45&5%
Richardson's Circular and Mill. 45@45&5%
Richardson's X Cuts ..... 45@45&5%
Richardson's Hand, &c ..... 25@25&5%
C E. Jennings & Co.'s brand 25%

Hack Saws—
Griffin's, complete ..... 40&10@50
Griffin's Hack Saw Blades ..... 40&10@50
Star Hack Saws and Blades 25%
Eureka and Crescent 25%

Scroll—
Lester, complete, $10.00 ..... 25%
Rogers, complete, $4.00 ..... 25%
Barnes' Builders' and Cab Makers' $15. 25%
Barnes' Scroll Saw Blades 35%

Saw Frames—See *Frames, Saw.*

Saw Sets—See *Sets, Saw.*

Saw Tools—See *Tools, Saw.*

Scales—
Hatch, Counter, No. 171, good quality, ₩ doz $18.00@$19.00
Hatch, Tea, No. 161 .. ₩ doz $6.50@$7.00
Union Platform, Plain ..... $2.10@2.20
Union Platform, Striped ..... $2.40@2.50
Chatillon's Grocers' Trip Scales 50%
Chatillon's Eureka 25%
Chatillon's Favorite 40%
Family, Turnbulls ..... 30@30&10
Riehle Bros.' Platform 40%

Scale Beams—See *Beams, Scale.*

Scissors, Fluting 45%

Scrapers—
Adjustable Box Scraper (S. R. & L. Co.) $6.00 ..... 30&10%
Box, 1 Handle ..... ₩ doz $2.25@$2.50
Box, 2 Handle ..... ₩ doz $3.00@$3.25
Defiance Box and Ship ..... 20&10%
Foot ..... 60&10&60%
Ship, Common ..... ₩ doz $3.50 net
Ship, R. I. Tool Co 10%

Screen Window and Door Frames—See *Frames*

Screw Drivers—See *Drivers, Screw.*

Screws—
Bench and Hand—
Bench, Iron ..... 55&10@55&10&10%
Bench, Wood, Beech ..... ₩ doz $2.25
Bench, Wood, Hickory ..... 30&10%
Hand, Wood ..... 25&10@25&10&5%
Hand, Grand Rapids, list 35%
Coach, Lag and Hand-Rail—
Lag, Blunt Point, list Jan. 1, 1890 ..... 80@80&10%
Coach and Lag, Gimlet Point, list Jan. 1, 1890 ..... 80@80&5%
Hand Rail, Sargent's ..... 70&10%
Hand Rail, H. & B. Mfg. Co. ..... 70&10@75%
Hand Rail, Am. Screw Co 75%
Jack Screws—
Jack Screws, Millers Falls list. 50@50&10%
Jack Screws, P., S. & W 35%
Jack Screws, Sargent 70%
Jack Screws, Stearns' ..... 40@40&10%
Cork—
Humason & Beckley Mfg. Co. .. 40&10@50%
Williamson's ..... 33⅓@33⅓&5%
Detroit Cork Screw Co 33⅓%
Machine—
Flat Head Iron 65%
Round Head Iron 60%
Wood—
List January 1, 1891.
Flat Head Iron 70%
Round Head Iron 65%
Flat Head Brass 70%
Round Head Brass 65%
Flat Head Bronze 70%
Round Head, Bronze 65%
} Extra 10 or 10& 10% often given.
Rogers' Drive Screws 82½%

Scroll Saws—See *Saws, Scroll.*

Scythes—
Grain ..... 40&5@40&10%
Grass ..... 40&10&50%

Scythe Snaths—See *Snaths, Scythe.*

Sets—
Awl and Tool—
Aiken's Sets, Awls and Tools, No. 20, ₩ doz $10.00 ..... 60@60&5%
Fray's Adj. Tool Hdls., Nos. 1, $12; 2, $18; 3, $12; 4, $9 ..... 45%
Millers Falls Adj. Tool Hdls., Nos. 1, $12; 2, $18 ..... 25%
Henry's Combination Haft ... ₩ doz $6.50
Stanley's Excelsior: No. 1, $7.50; No. 2, $4.00; No. 3, $5.50 ..... 30&10%
Common Brad Sets, No. 42, $10.50; No. 43, $12.50 .. 70&10&5%
Nail—
Square ..... ₩ gr. $4.00@$4.25
Round ..... ₩ gr. $3.25
Buck Bros. 27½%
Cannon's Diamond Point ... ₩ gr. $12, 20%
Rivet—
Regular list 70%
Saw—
Stillman's Genuine .... ₩ doz $5.00@7.75, 40&5%
Stillman's Pattern, Hand, ₩ doz $3.25; Cross Cut, $5.25 ..... 55%
Common Lever ..... ₩ doz $2.00, 45@50%
Morrill's No. 1, $14.00 ..... 40&20%
No. 11, $15.50 ..... 40&20%
Nos. 3 and 4, Cross Cut, $22.50 .. 40&20%
No. 5, Mill, $30.00 ..... 40&20%
No. 10, $15.00 ..... 40&20%
Leach's .. No. 0, $8.00; No. 1, $15 .. 15@20%
Nash's ..... 20&10@20&10&10
Hammer, Bemis & Call Co.'s new Pat. ..... 30&5%
Bemis & Call Co.'s Lever and Spring Hammer ..... 30&5%
Bemis & Call Co.'s Plate 10%
Bemis & Call Co.'s Cross Cut 12½%
Aiken's Genuine ..... $13.00, 50&10@60%
Aiken's Imitation ..... $7.00, 55&5%
Hart's Pat. Lever 20%
Diston's Star 55%
Leopold ..... 40&10@50%
Atkin's Lever ..... ₩ doz No. 1, $6.00
Atkin's Criterion ..... ₩ doz No. 1, $6.00
Croissant (Keller), No. 1, $15.00; No. 2, $24.00 ..... 40&10%
Avery's Saw Set and Punch 50%
Kohler's Royal ..... ₩ doz $7.00
Kohler's Giant Royal ..... ₩ doz $12.00
Crescent ..... ₩ doz $3.00
Lloyd's Acme ..... ₩ doz $15, 40&10%
Taintor Positive ..... ₩ doz $18, 50%

Sharpeners, Knife—
Larkins'.
Applewood Handles ... ₩ doz. $6.00, 40%
Rosewood or Cocobola. ₩ doz. $9.00 40%

Shaves, Spoke—
Iron 45%
Wood 30%
Bailey's (Stanley R. & L. Co.) ..... 40&10%
Stearns' ..... 30&10%
Cincinnati ..... 25&10%
Goodell's ₩ doz. $9.00 ..... 25%

Shears—
American (Cast) Iron .. 75&10@75&10&5%
Barnard's Lamp Trimmers .. ₩ doz. $3.75
Seymour's, List Dec. 1881. 60&10&10@60&10&10&5%
Heinisch's, List Dec. 1881. 60&10&10@60&10&10&5
Heinisch's Tailor's Shears 33⅓%
Cast Steel Trimmers:
First quality ..... 80@80&10%
Second quality ..... 50&10@80&10&10%
Acme Cast Shears ..... 10&10%
Diamond Cast Shears 10%
Victor Cast Shears ..... 75&10@75&10&5%
Howe Bros. & Hulbert, Solid Forged Steel 40%
Hatch Cutlery Co., Solid Steel Forged. 60%
Davenport Cutlery Co ..... 60@60&10%
Clauss Shear Co., Japanned 70%
Clauss Shear Co., Nickeled, same list. 60%
Galvanic 3½ to 9 in., ₩ doz. $1.00 ₩ inch
Electric Cutlery Co ..... Net
Campbell Cutlery Co., Jap'd 75%
Nickel Plated 65%

Pruning Shears and Hooks
Disston's Combined Pruning Hook and Saw ..... ₩ doz. $18.00, 20&10%
Diston's Pruning Hook, ₩ doz. $12.00 ..... 20&10%
E.S. Lee & Co.'s Pruning Tools. 50&10&10%
Pruning Shears, Henry's Pat., ₩ doz. $3.75@$4.00
Henry's Pruning Shears, ₩ doz. $4.25 @$4.50
Wheeler, M. & C. Co., Combination, ₩ doz $12.00, 20%
Dunlap's Saw and Chisel, ₩ doz $8.50, 30%
J. Mallinson & Co., No. 1, $5.25; No. 2, $7.25
P., S. & W. Co. 40%
Levin Pruner No. 1, $15.00 ₩ doz .40&2½
Levin Pruner No. 2, $21.00 ₩ doz. .40&2½

Tinners', &c.—
Shears and Snips (P. S. & W.) ..... 30@35%
Snips, J. Mallinson & Co 33⅓%

Sheaves—
Sliding Door—
M. W. Co., list July, 1888 .. 50&10@60&5%
R. & E., list Dec. 18, 1885 ..... 55&20%
Corbin's list ..... 60&10&5%
Patent Roller ..... 60&10&5%
Patent Roller, Hatfield's 75%
Russell's Anti-Friction, list Dec. 18, 1885 ..... 60&5%
Moore's Anti-Friction 50%
Sliding Shutter—
R. & E., list Dec. 18, 1885 ..... 60&10&5%
Sargent's list 70%
Reading list ..... 60&10&10%

Shells—
First quality 4, 8, 10 and 12 gauge ..... 25&10&5%
First quality Rival, Club and Climax brands, 14, 16 and 20 gauge ($7.50 list) ..... 20&10&5%
Prize ..... 40&5%
Star, Club, Rival and Climax Brands ... 33⅓&10&5%
Smokeless brand, 12, 10, 16 gauge. 33⅓&10&5%
Trap brand, 12 and 10 gauge .. 33⅓&10&5%
Selbold's Comb. Shot Shells ..... 15&5%
Brass Shot Shells, 1st quality ..... 60&5%
Brass Shot Shells, Club, Rival, Climax. 65&5%
Shells, Loaded—
Standard List, July 19, 1890 ..... 40&10&10@40&10&10&5%

Ship Tools—
L. & I. J. White ..... 20&5%

Shoes, Horse, Mule, &c.—
Horse—
Burden's, Perkins', Phœnix, Standard, Diamond State and Bryden's Boss, at factory $4.00
Bryden's Frog Pressure, at factory .. $5.00
Mule—
Add $1 ₩ keg to above prices.
Ox Wrought—
Ton lots ..... ₩ ℔ 3¢
1000 ℔ lots ..... ₩ ℔ 3½¢
500 ℔ lots ..... ₩ ℔ 4¢

Shot—
	Small lots.	In ton lots of this size (2000 ℔) to a car.
Drop, up to B, 25-℔ bag	$1.45	
Drop, up to B, 5-℔ bag	.35	
Drop, B and larger, 25-℔ bag	1.70	
Drop, B and larger, 5-℔ bag	.40	
Buck and Chilled, 25-℔ bag	1.70	
Buck and Chilled, 5-℔ bag	.40	
Dust Shot, 25-℔ bag	2.00	
Dust Shot, 5-℔ bag	.45	

Shovels and Spades—
Ames' Shovels, Spades, &c., list Nov. 1, 1885 ..... 20%
NOTE.—Jobbers frequently give 5@7½% extra on above.
Griffith's Black Iron ..... 50&10%
Griffith's C. S. ..... 60@60&5%
Griffith's Solid C. S. R. R. Goods 20%
St. Louis Shovel Co ..... 20@20&7½%
Hussey, Blanx & Co ..... 15@25%
Hubbard & Co ..... 20@20&7½%
Lehigh Mfg. Co ..... 50&10%
H. M. Myers Co 30%
Payne Pettebone & Son ..... 35%&5%
Remington's (Lowman's Pat.) 40&10&50%
Rowland's Black Iron .. 50&10@50&10&5%
Rowland's Steel ..... 60@5@60&10%
Terra Haute Shovel & 33%

Shovels and Tongs—
Iron Head ..... 60&10@60&10&5%
Brass Head ..... 60&10&10%

Sieves—
Mann's Tin Rim ..... 50&20%
Buffalo Metallic, S. S. & Co ..... 50&20%
Shaker (Barler's Pat.) Flour Sifters ₩ gr $18.00@$20.00
Electric ..... ₩ gr $17.00@$20.00
A. & W. Sifters ..... ₩ gr $18.00@$20.00
Hunter's ..... ₩ gr $18.00@$20.00

Sieves, Wooden Rim—
	Iron	Plated.
Mesh 18, Nested, ₩ doz	$0.80	$1.00
Mesh 20, Nested, ₩ doz	.95	1.10
Mesh 24, Nested, ₩ doz	1.15	1.35

Sinks, Wrought Steel—
Columbus, Painted or Unpainted ..... 30@30&10 %
Columbus, Galvanized and Enameled. 50@50&10 %
New Era, Painted ..... 40&10@50&5 %
New Era, Galvanized and Enameled ... 60&10&10@70&5 %

Skeins, Thimble—
Western list ..... 75&5@75&10%
Columbus Wrt. Steel. Special net prices
Coldbrookdale Iron Co 60%
Seneca Falls Pattern 60%
Utica P. S. T. Skeins 60%
Utica Turned and Fitted 30%

Slates—
School, by case ..... 50&10@50&10&10%

Sleds, Hand—
Tubular Steel ..... ₩ doz $24.00 40&5% (Lots of 6 doz 50%)

Snaps, Harness, &c.—

Anchor (T. & S. Mfg. Co.)....65%
Fitch's (Bristol)....50&10%
Hotchkiss....10%
Andrews....50%
Sargent's Patent Guarded....70&10&10%
German, new list....40&10%
Covert....50&10&5&2½
Covert, New Patent....50&10&5&2½
Covert, New R. E....60&10&5&2½
Covered Spring....60&10&10%
Covert's Saddlery Works' Triumph 33⅓&
John Prots Snaps....75@75&5%

Snaths, Scythe—

List....50@50&5%

Soldering Irons—

See *Irons, Soldering.*

Spittoons, Cuspidors, &c.

Standard Fiberware—

Cuspidors, 8¼-inch, ₱ doz., No. 5, $8; No. 5X, $9.
Spittoons, Daisy, 8-inch, No. 1, 4; 10 and 11 inch, $6.

Spoke Shaves—

See *Shaves, Spoke.*

Spoke Trimmers—

See *Trimmers, Spoke.*

Spoons and Forks—

Tinned Iron—

Basting, Cen. Stamp. Co.'s list....70&10%
Solid Table and Tea, Cen. Stamp. Co.'s list....70&10%
Buffalo, S. S. & Co....33⅓&2%

Silver Plated—

months or 5% cash 30 days:
Meriden Brit. Co., Rogers....40&15%
C. Rogers & Bros....40&15%
Rogers & Bros....40&15%
Reed & Barton....40@40&5%
Wm. Rogers Mfg. Co....40, 15&5%
Simpson, Hall, Miller & Co....40, 15&5%
Holmes & Edwards Silver Co....40, 15&5%
L. Boardman & Son....50&12½&5

Miscellaneous—

Holmes & Edwards Silver Co.:
No. 67 Mexican Silver....50&10&5%
No. 80 Silver Metal....50&10&5%
No. 24 German Silver....50&10&5%
No. 50 Nickel Silver....50&5%
No. 49 Nickel Silver....50&10&5%
Wm. Rogers Mfg. Co.:
Rogers' Silver Metal....50&10&5%
18% Rogers' German Silver....60&5%
25% Rogers' Nickel Silver....50&5%
German Silver....50@50&5%
German Silver, Hall & Elton...50&5% cash
Nickel Silver....50&5@50&10&5% cash
Brittannia....60@60&5%
Boardman's Nickel Silver, list July 1, 1891....60&7½&5%
Boardman's Brittannia Spoons, case lots....60&5% cash

Springs—

Door—

Torrey's Rod, 39 in....₱ doz $1.20@1.2
Warner's No. 1, ₱ doz $1.50; No. 2, $3.40....55@55&10%
Gem (Coil), list April 19, 1886....20%
Star (Coil), list April 19, 1886....20&10%
Victor (Coil)....60&10@60&10&5%
Champion (Coil)....60&10@60&10&5%
Cowell's, No. 1, ₱ doz $18.00; No. 2, $15.00....50@50&10%
Rubber, complete, ₱ doz $4.50....55&10%
Hercules....50@50&10%
Phœnix....33⅓&5

Carriage, Wagon, &c.—

Elliptic, Concord, Platform and Half Scroll....60&10@60&10&10&10 or net prices
Cliff's Bolster Springs....25%

Squares—

Steel and Iron, Nickel-Plated....85@85&5%
Try Square and T Bevels....60&10&10%
Disston's Try Square and T Bevels....50%
Winterbottom's Try and Miter....30&10%
Starrett's Micrometer Caliper Squares....25%
Avery's Flush Bevel Squares....40%
Avery's Bevel Protractor....50%

Squeezers—

Fodder—

Blair's....₱ doz $2.00
Blair's "Climax"....₱ doz $1.25

Lemon—

orcelain Lined, No. 1....₱ doz $6.00 25&30%
Wood, No. 2....₱ doz $3.00, 35%
Wood, Common....₱ doz $1.70@1.75
Dunlap's Improved....₱ doz $3.75, 20%
Sammis....No. 1, $5.00; No. 2, $9; 12, $18 ₱ doz....25&10%
Jennings' Star....₱ doz $2.50
The Boss....₱ doz $2.50
Dean's...Nos. 1, ₱ doz $6.50; 2, $3.35; 3, $1.90; Queen, $2.50
Little Giant....50&50&5%
King....40&5%
Hotchkiss Straight Flash....₱ doz $12.00
Silver & Co., Glass....₱ gro. $9.00

Standard Fiber Ware—

See *Ware, Standard Fiber.*

Staples—

Barbed Blind, ¼ in. and larger, ₱ 2.7@2.7½
Barbed Blind, ¾ in....₱ lb 8@8½
Fence Staples, Galvanized, Same price as B'rb Wire
Fence Staples Plain, See Trd. Rep.
Grand Crossing Tack Co.'s list ...75&10%

Steelyards....40&10@50%

Stocks and Dies—

Blacksmith's:
Waterford Goods....35%
Butterfield's Goods....35%
Lightning Screw Plate....35&30%
Beece's New Screw Plates....25@30%
Reversible Ratchet....30%
Gardner....25%
Green River....25@30%

Stops, Bench—

Morrill's, ₱ doz., Nos. 1, $0.50; 2, $12.00 40&20%
tchkiss's....₱ doz $5, 10@10&10%
Weston's, No. 1, $10 No. 2, $9, 25&10&5%
McGill's, ₱ doz $3....10%
Cincinnati....25&10%
Terrell's Nos. 1 and 2, ₱ doz., $3; No. 3, $3.60....30%

Stone—

Stones, Grind—See *Grindstones.*

Scythe Stones—

Pike Mfg. Co., list April, 1892....33⅓%
Cleveland Stone Co., list Nov. 1892...33⅓%

Oil Stones, &c.—

Pike Mfg. Co:
Hindostan No. 1, ₱ lb....8¢
Sand Stone....5¢ } 40@40&10%
Turkey Oil Stone, 4 to 8 in....80¢
Turkey Slips....$2.00
Washita Stone, Extra....50¢
Washita Stone, No. 1....40¢
Washita Stone, No. 2....30¢
Washita Slips, Extra....80¢
Washita Slips, No. 1....70¢
Arkansas Stone, No. 1, 3 to 5¼ in., $2.80 } 33⅓@33⅓&10%
Arkansas Stone, No. 1 5¼ to 8 in., $3.50
Lake Superior....₱ lb 13¢
Lake Superior Slips....₱ lb 20¢

Stove Polish—

See *Polish, Stove.*

Stretchers Carpet—

Cast Steel, Polished....₱ doz $2.2
Cast Iron, Steel Points....₱ doz 75@80¢
Socket....₱ doz $1.75
Bullard's....25@25&10%

Strops, Razor—

Genuine Emerson....60@60&5%
Imitation " ..₱ doz $3.00, 20&10&5%
Torrey's....20%
Badger's Belt and Com....₱ doz $2.00
Lamont Combination....₱ doz $4.00
Jordan's Pat. Padded, list Nov. 1, '89, 50%
Electric Cutlery Co....Net
Campbell Cutlery Co....Net

Stuffer, Sausage—

Miles' Challenge, ₱ doz $20....50@50&5%
Perry....₱ doz., No. 1, $15.00; No. 0, $21.00....50&5@50&10%
Draw Cut No. 4, each $30.00....20%
Enterprise Mfg. Co., list Jan 17, '93..25%
Silver's....40&10%

Sweepers, Carpet and Lawn—

Carpet—

Bissell No. 5....₱ doz $17.00
Bissell No. 8....₱ doz $20.00
Bissell, Grand....₱ doz $36.00
Standard....₱ doz $24.00
Domestic....₱ doz $21.00
Domestic, No. 2....₱ doz $22.00
Grand Rapids....₱ doz $24.00
Crown Jewel, No. 1, $18.00; No. 2, $19.00; No. 3, $20.00
Magic....₱ doz $15.00
Improved Parlor Queen, Nickeled....₱ doz $27.00
Japanned....₱ doz $24.00
Excelsior....₱ doz $22.00
Garland....₱ doz $18.00
Parlor Queen....₱ doz $24.00
Housewife's Delight....₱ doz $15.00
Ladies' Friend....₱ doz $15.00
Ladies' Friend No. 2....₱ doz $16.00
Advance....₱ doz $18.00
Our Leader....₱ doz $19.00
Triumph....₱ doz $20.00
Goshen....₱ doz $21.00
Supreme....₱ doz $22.00
Easy....₱ doz $22.00
Gilt Edge....₱ doz $24.00
Acme....₱ doz $26.00
Imperial....₱ doz $26.00
Grand Republic....₱ doz $30.00
Banner....₱ doz $22.00
The Star....₱ doz $21.00
Reliable....₱ doz $22.00
The Rapid....₱ doz $22.00
Our Own....₱ doz $27.00
Model....₱ doz $27.00

Goshen Sweeper Company, Grand Rapids, Mich., make the following rebates:
5 dozen in 6 months....₱ doz $1.00
10 dozen in 6 months....₱ doz $2.00
25 dozen in 6 months....₱ doz $3.00
Except on L. F., when 10 dozen price is $13.50, and 25 dozen $13.00.

Lawn—

Thompson Mfg. Co....80%

Swings—

Davies Lawn....25%

Tacks, Brads &c.—

List October 19, 1889. Old established straight Weights. Short Weight goods are sold at lower prices.

Carpet Tacks—
American, Blued....66⅔%
American, Tin'd and Cop'd....70%
Steel, Bright and Blued....66⅔%
Steel, Tinned and Coppered....70%
Swedes Iron, Blued....72½%
Swedes Iron, Tinned....75%
American Iron Tacks, Domestic....66⅔%
Swedes Iron Tacks—
S. S., Blued....66⅔%
S. S., Tinned....70%
Lanc., Blued....55%
Lanc., Tinned....60%
Gimp and Lace Tacks—
S. S., Blued....62½%
S. S., Tinned....66⅔%
Lanc., Blued....55%
Lanc., Tinned....60%
Basket and Trimmers' Tacks—
Lanc....52½%
S. S....60%
Hungarian Nails....60%
Common and Patent Brads....55%
Leathered Tacks....10%
Brush Tacks, S. S....60%
Looking Glass Tacks, S. S....35%
Picture-Frame Points, S. S....35%
Finishing Nails....60%
Trunk and Clout Nails—
Black....62½%
Tinned or Coppered....66⅔%
Basket Nails....60%
Chair Nails....62½%
Cigar Box Nails....45%
Tin Capped Nails....80%

Extra discount 25&2%

Miscellaneous—

Double Point....90@90&10%
Wire Carpet Nails....80&10%
Claw Handle Carpet....₱ gross $4.00
Bonnie Blue....₱ box 1 50
Bill Nye Brad Box....4 00
Parisian Gilt Nails, cartoon....50
Home Tacks, No. 50 ₱ case (12 cartons), $36.00; No. 100, ₱ case (12 cartons), $72.00 } 50&2%
Home Nails, No. 200, ₱ case (12 cartons), $30.00; No. 400, ₱ case (12 cartons), $60.00
Upholsterers' Nails....50&10%

Wire Brads and Nails

Steel-Wire Brads, R. & E. Mfg. Co.'s list 50&10%

See also *Nails, Wire.*

Tanks, Oil—

Emerald, S. S. & Co.: 30-gal. $8.75; 60-gal., $11 each....50&10%

Tapes, Measuring—

American....40@40&5%
Spring....40%
Chesterman's, Regular list....25@30%

Thermometers—

Tin Case....80@80&10%

Thimble Skeins—See *Skeins.*

Ties, Bale—Steel.

Standard Wire, list....50&10&5%

Tinners' Shears, &c —

See *Shears, Tinners' &c.*

Tinware—

Stamped, Japanned and Pieced, list Jan 20, 1887....70&10@70&25%

Tire Benders, Upsetters, &c.—See *Benders and Upsetters, Tire.*

Tobacco Cutters—

See *Cutters, Tobacco.*

Tools—

Coopers'—

Bradley's....20%
Barton's....20@20&5%
L. & I. J. White....20&5%
Albertson Mfg. Co....25%
Beatty's....30%
Sandusky Tool Co....30@30&5%
Shaves Cincinnati Tool Co....20%

Lumber—

Ring Peavies, "Blue Line"..₱ doz $20.00
Ring Peavies, Common....₱ doz $18.00
Steel Socket Peavies....₱ doz $21.00
Mail, Iron Socket Peavies....₱ doz $19.00
Cant Hooks, "blue Line"....₱ doz $16.00
Cant Hooks, Common Finish..₱ doz $14.00
Cant Hooks, Mail. Socket Clasp, "Blue Line" Finish....$16.00
Cant Hooks, Mail. Socket Clasp, Common Finish....₱ doz $14.50
Cant Hooks, Clip Clasp, Common Finish....₱ doz $14.00
Cant Hooks, Clip Clasp, Common Finish....₱ doz $12.00
Hand Spikes....₱ doz 6 ft., $15.00; 8 ft., $20.00
Pike Poles, Pike & Hook, ₱ doz, 12 ft., $11.50; 14 ft., $12.50; 16 ft., $14.50; 18 ft., $17.50; 20 ft., $21.50.
Pike Poles, Pike only, ₱ doz, 12 ft., $10.00; 14 ft., $11.00; 16 ft., $13.00; 18 ft., $16.00; 20 ft., $20.00.
Pike Poles, not ironed, ₱ doz, 12 ft., $6.00; 14 ft., $7.00; 16 ft., $9.00; 18 ft., $12.00; 20 ft., $16.00.
Setting Poles, ₱ doz. 12 ft., $14.00; 14 ft., $15.00; 16 ft., $17.00.
Swamp Hooks....₱ doz $18.00

Saw—

Atkins', new list....40%

Transom Lifters—

See *Lifters, Transom.*

Traps—

Game—

Newhouse....40@40&5%
Oneida Pattern....70&10%
Game, Blake's Patent....40&10&5%

Mouse and Rat—

Mouse Wood, Choker, ₱ doz holes, 9@10¢
Mouse, Round Wire....₱ doz $1.50 10%
Mouse, Cage, Wire....₱ doz $2.50 10%
Mouse, Catch-'em-alive..₱ doz $2.50 15%
Mouse, Bonanza....₱ doz 0.90@$1.00
Rat, Decoy....₱ gr $10.00, 10%
Ideal....₱ gr $10.00
Cyclone....₱ gr $5.25
Hotchkiss Metallic Mouse, 5-hole traps, ₱ doz., 75¢; in full cases, ₱ doz. 60@65¢
Hotchkiss Imp. Rat Killer...₱ gro $18.50
Hotchkiss New Rat Killer...₱ gro $16.50
Schuyler's Rat Killer....₱ gro $15.00
Dandy....₱ doz., $1.75

Triers—

Butter and Cheese....25%

Trimmers, Spoke—

Bonney's....₱ doz $10.00, 50%
Stearns'....20&10%
Ives', No. 1, $15.00; No. 2, $12.00 ₱ doz. 55&10%
Douglas'....₱ doz $9.00, 20%
Cincinnati....25%

Trowels—

Lothrop's Brick and Plastering, 20&10&5@35%
Reed's Brick and Plastering....15%
Disston's Br'k and Plastering..25@25&10%
Peace's Plastering....25@25&5%
Clement & Maynard's....20@20&5%
Rose's Brick....15@20%
Brade's Brick....25%
Worrall's Brick and Plastering....20%
Garden....70%
Cleves' Angle Trowel, ₱ gro, No. 1, $36; No. 2, $30; No. 3, $15. net @ 10%

Trucks, Warehouse, &c.—

B. & L. Block Co.'s list....40%
Thompson Mfg. Co....40%
Barnes' Barrel Trucks....40%

Tubes Boiler—

See Pipe

Twine—

Flax Twine—

	BC.	B.
No. 9, ¼ and ½ ℔ Balls	20¢	21¢
No. 12, ¼ and ½ ℔ Balls	23¢	30¢
No. 18, ¼ and ½ ℔ Balls	20¢	25¢
No. 24, ¼ and ½ ℔ Balls	20¢	25¢
No. 36, ¼ and ½ ℔ Balls	18¢	23¢

No. 264 Mattrass, ¼ and ½ ℔ Balls, 53@54¢
Chalk Line, Cotton, ½ ℔ Balls....25¢
Mason Line, Linen, ½ ℔ Balls....55¢
2-Ply Hemp, ¼ and ½ ℔ Balls (Spring Twine)....15¢
3-Ply Hemp, 1 ℔ Balls....16@16¢
3-Ply Hemp, 1½ ℔ Balls....15@15¢
Cotton Wrapping, 5 Balls to ℔...15@16¢
2, 3, 4 and 5 Ply Jute, ½ ℔ Balls....10¢
Wool....6½@6½¢
Paper....13@14¢
Cotton Mops, 6, 9, 12 and 15 ₱ to doz...18¢

Vises—

Solid Box....50&10@60%

Parallel—

Fisher & Norris Double Screw....15&10%
Stephens'....25@30%
Parker's....20@25%
Wilson's....55%
Howard's....40%
Bonney's....50%
Millers' Falls....40@40&10%
Trenton....40&5@40&10%
Merrill's....15@20%
Hollands'....35@40%
Sargent's....70&10%
Backus and Union....40%
Double Screw Leg....15&10%
Prentiss....30@35%
Simpson's Adjustable....40%
Moore's....20%
Massey Quick Action....30@35%

Saw Filers—

Bonney's, Nos. 2 & 3, $15.00....40&10%
Stearn's....33⅓&10@33⅓&10&10%
Stearn's Silent Saw Vises....33⅓@35%
Hopkins'....₱ doz $17.50, 10%
Reading....40&10%
Wentworth....20&10%
Economy, ₱ doz., Nos. 110, $10.00; 120, $15.00....50&10&10&5%

Miscellaneous—

Phœnix Vises....33⅓%
Phœnix Hand Vises....₱ doz $3.60, 33⅓%
Cowell Hand Vises....20%
Bauer's Pipe Vises....10%
Cincinnati....25&10%
Enterprise Pipe Vises....each $5.00, 40%
Massey Combination Pipe Vise....40%

Wads—Price Per M.

U.M.C.&W.R.A.—B. E., 11 up..68¢
U.M.C.&W.R.A.—B. E., 9&10..82¢
U.M.C.&W.R.A.—B. E., 8....90¢
U.M.C.&W.R.A.—B. E., 7....$1.10
U.M.C.&W.R.A.—P. E., 11 up..1.15
U.M.C.&W.R.A.—P. E., 9&10..1.50
U.M.C.&W.R.A.—P. E., 8....1.70
U.M.C.&W.R.A—P. E., 7....1.80
Eley's B. E., 11 and larger....$1.70@$1.75
Eley's P. E., 12 to 20....3.00@ 3.25

Dis. 30&2½%

Wagon Boxes—

See *Boxes, Wagon.*

Wagon Jacks—

See *Jacks, Wagon.*

Ware, Hollow—

Cast Iron, Hollow—

Stove Hollow-Ware—
Ground....60&10@60&10&10%
Unground....65&10@70&5%
White Enameled Ware—
Maslin Kettles....70&10@75%
Boilers and Saucepans....60@60&5%
Tinned Boilers and S'pans....60@60&5%
Rustless Hollow Ware....50@50&5%
Gray Enameled Ware—
Stove....50%
Maslin Kettles....60@60&10%
Boilers and Saucepans....40&5%

Enameled—

Agate and Granite Ware, list Jan. 1, 1889....33⅓&10%
Ironclad Enameled Ware....dis 33⅓&10%

Kettles—

Galvanized Tea-Kettles—

Inch....	6	7	8	9
Each....	55¢	60¢	65¢	75¢

Standard Fiber—

	Per Doz. Plain.	Decorated.
Wash-Basins, 10½ in....	$1.80	2 00
Wash-Basins, 12 in....	2.00	2.50
Keelers, 11½ in....		3.50
Cuspidors....		7.50
Spittoons, "Daisy," 8 in.	3.50	4.00
Peck Measure....	3.50	
Half-peck Measure....	3.00	

See also Pails.

Indurated Fiber.—

Spittoons No. 2, ₱ doz....$6.00
Basins, Ringed, ₱ doz., No. 2....2.80
Washtubs, Nested, Nos. 0, 1, 2 and 3 (4 pieces), ₱ nest....$5.75
Keelers Nested, Nos. 1, 2, 3 and 4 (4 pieces), ₱ nest....$2.55
Butter Bowls 15, 17 and 19-inch (3 pieces), ₱ nest....$1.50
Liquid Measures, pt., qt., 2 qt. and funnell (4 pieces), ₱ set....$1.90

Dis. 30&2½%

See also Pails.

Silver Plated, Hollow—

4 mo. or 5% cash in 30 days.
Reed & Barton....
Meriden Britannia Co....
Simpson, Hall, Miller & Co....
Rogers & Brother....
Hartford Silver Plate Co.....
William Rogers Mfg. Co....

40&5&2½

Washers—

size hole....5-16 ⅜ ½ ⅝ to 1⅛
Washers....5½ 4½ 3½ 2½
In lots less than 200 ₱, ₱ ₱, add ½¢, 5-lb boxes 1¢ to list.

Washer Cutters—

See *Cutters, Washers.*

Water Coolers—

See *Coolers, Water.*

Wedges—

Iron....₱ lb 3½¢
Steel....₱ lb 3½¢

Weights, Sash—

Solid Eyes....₱ ton $18.00@$19.00

Well Buckets Galvanized—See *Buckets, Well, Galvanized.*

Wheels Well—

8 in., $2.00 10 in. $2.50 12 in $3

Whips

American Whip Co.: Length.	4½	5	5½	6	6½	7	7½	8 ft.
X. L. Whalebone Driving...	$18.00	20.00	22.00	24.00	27.00	30.00	33.00	36.00
Eureka, Two-thirds Whalebone.	....	....	15.00	16.50	18.00	20.00	....	....
Bull Bone, Half-length Whalebone.	....	....	11.00	12.00	13.00	15.00	....	....
American Standard	3.00	3.50	9.50	10.50	12.00	13.50	15.00	16.50
True Grip, Raw Hide Center....	6.00	6.00	6.50	7.00	7.50	9.00	....	....
New Name, Stocked Java, Black and Wine Colors	....	....	....	6.00	...	....	....	....
Americus, 93 Fen Whip	....	....	....	6.00	....	....	....	....
Gents' Light Driving No. 111...	....	....	....	6.00	....	....	....	....
Gents' Light Driving No. 106...	....	....	....	5.00	....	....	....	....
Hand-made Stocked Java No. 103	....	....	3.75	4.00	....	....	....	....

Per dozen.

A large variety of cheaper grades.....50¢@$3.00
Team Whips.....$2.00@$7.50
Toy Whips.....₩ gro. $2.50@$12.00
Hardware Assortment, 10/American, 75 Whips for $60.00.

Wire and Wire Goods—

Iron—

Market,
Br. & Ann., Nos. 0 to 18. 75&10@75&10&5%
Cop'd, Nos. 0 to 18. 75&5%
Galv., Nos. 0 to 18. 70&5@70&10%
Tin'd, Tin'd list, Nos. 0 to 18. 70@70&10%
} Extra 10% often given.

Stone,
Br. and Ann'd, Nos. 16 to 18. 80%
Bright and Ann'd, Nos. 19 to 26. 80&5%
Br. and Ann'd, Nos. 27 to 36. 82½&5%
Tinned. 65&10%
} Extra 10% often given.

Tinned Broom Wire, 18 to 21, ₩ ℔....4½¢
Galvanized Fence.....75&10%
Brass, list Jan. 18, 1884.....40&5%
Copper, list Jan. 18, 1884.....40@5%
Annealed Wire on Spools.....60%
Malin's An'aled & Tin'd on Spools..60&5%
Malin's Brass and Cop. on Spools...50&5%
Tate's Spooled, Tin'd & Annealed..60&5%
Tate's Spooled Cop. and Brass.....50%
Cast Steel Wire.....50%
Stubs' Steel Wire.....$6.00 to 2, 30%
Steel Music Wire, 12 to 30, Imported.... 60@70¢ ₩ ℔
Wire Clothes Line, see Lines.
Wire Picture Cord, see Cord.

Bright Wire Goods—

Standard list.....85@85&10%

Wire Cloth and Netting—

Painted Screen Cloth, good quality, ₩ 100 sq. ft. $1.40
Galvanized Wire Netting.....75@75&10%

Wire, Barb—

See Trade Report.

Wire Rope—See *Rope, Wire.*

Wrenches—

American Adjustable.....40%
Baxter's Adjustable "S".....40&10@50%
Baxter's Diagonal.....60%
Coes' Genuine.....50&5%
Coes' "Mechanics".....50&10&3%
Girard Standard.....65&10@70%
Lamson & Sessions' Engineers'....60&10%
Lamson & Sessions' Standard.....70&10%
P. S. & W. Agricultural.....
Girard Agricultural.....
Lamson & Sessions' Agric'l..
W. & B. Diamond.....
} 75&10@80%

Bemis & Call's:
Pat. Combination.....40%
Merrick's Pattern.....35%
Brigg s Pattern.....25%
Cylinder or Gas Pipe.....40&5%
No. 3 Pipe.....50%
Aiken's Pocket (Bright).....$6.00, 50&10%
The Favorite Pocket.....₩ doz., $4.00, 40%
Webster's Pat. Combination.....35%
Boardman's.....30%
Always Ready.....25&2%
Alligator.....50%
Donohue's Engineer.....20&10%
Eagle.....50&10%
Acme, Bright.....50&2%
Acme, Nickeled.....40&2%
Hercules.....70@70&5%
Walker's.....55&2%
Diamond Steel.....55&2%
Cincinnati Brace Wrenches.....25&10%
Tafts Vise Wrench.....55&10&2%

Wringers, Clothes—

Am. Wringer Co.'s list, Jan. 2, '93..2% cash
Colby WringerCo., list Sept. 1, '91..2% cash
Lovell Mfg. Co., list Jan. 1, 1892..2% cash
Peerless Mfg. Co., list Feb., 1892..2% cash
National Wringer & Mfg. Co., list June 1, 1892.....2% cash

Wrought Goods—

Staples, Hooks, &c., list March 17, 1892 85&10@85&10%

Paints, Oils and Colors.—Wholesale Prices.

Animal and Vegetable Oils—

Linseed, City, raw.. per gal.	..	@	50
Linseed, City, boiled	..	@	53
Linseed, Western, raw	..	@	50
Lard, City, Extra Winter	..	@	1.00
Lard, City, Prime	98	@	1.00
Lard, City, Extra No. 1	75	@	80
Lard, City, No. 1	65	@	70
Lard, Western, prime	98	@	..
Cotton-seed, Crude, prime..	45	@	..
Cotton-seed, Crude, off grades	40	@	43
Cotton-seed, Summer Yellow, prime	53	@	55
Cotton-seed, Summer Yellow, off grades	48	@	50
Sperm, Crude	..	@	1.00
Sperm, Natural Spring	..	@	..
Sperm, Bleached Spring	..	@	..
Sperm, Natural Winter	1.00	@	1.03
Sperm, Bleached Winter	1.05	@	1.08
Whale, Crude	..	@	..
Whale, Natural Winter	55	@	56
Whale, Bleached Winter	..	@	58
Whale, Extra Bleached	59	@	60
Sea Elephant, Bleached Winter	..	@	..
Menhaden, Crude, Sound	40	@	..
Menhaden, Crude, Southern	..	@	..
Menhaden, Light Pressed	42	@	43
Menhaden, Bleached W'ter.	45	@	..
Menhaden, Extra Bleached.	48	@	..
Tallow, City, prime	70	@	75
Tallow, Western, prime	65	@	70
Cocoanut, Ceylon	6½	@	..
Cocoanut, Cochin	..	@	7¼
Cod, Domestic	38	@	40
Cod, Foreign	42	@	45
Red Elaine	40	@	45
Red Saponified	₩ ℔ 7	@	7¼
Bank, per gal	40	@	41
Straits	41	@	42
Olive, Italian, bbls	63	@	65
Neatsfoot, prime	80	@	90
Palm, prime, Lagos	₩ ℔ 7¾	@	8¼

Mineral Oils—

Black, 29 gravity, 25 @ 30 cold test, per gal	7	@	7¼
Black, 29 gravity, 15 cold test	7½	@	8
Black, 29 gravity, summer..	6	@	6¼
Cylinder, light, filtered	14	@	16
Cylinder, dark, filtered	10	@	13
Paraffine, 23¾ @ 24 gravity..	11	@	12
Paraffine, 25 gravity	10	@	11
Paraffine, 28 gravity	7½	@	8
Paraffine, red	9½	@	10½

Paints and Colors—

Barytes, Foreign, ℔ ton	$22.00	@	24.00
Barytes, Amer. floated	29.00	@	32.00
Barytes, Amer. No. 1	16.00	@	18.00
Barytes, Amer. No. 2	13.00	@	15.00
Barytes, Amer. No. 3	11.00	@	12.00
Blue, Celestial	₩ ℔ 6	@	8
Blue, Chinese	40	@	50
Blue, Prussian	25	@	40
Blue, Ultramarine	8	@	25
Brown, Spanish		½@	1
Brown, Vandyke, Amer..	3	@	3½
Brown, Vandyke, English..	6	@	8
Carmine, No. 40, in bulk..	2.75	@	..
Carmine, No. 40, in boxes or barrels	2.85	@	..
Carmine, No. 40, in ounce bottles	3.75	@	..
Chalk, in bulk	₩ ton	@	2.25
Chalk, in bbls	₩ 100 ℔ 33	@	40
China Clay, English	₩ ton	13.00	@18.00
Cobalt Oxide, prep'd		9.00	@11.00
Cobalt Oxide, black, lots 100 ℔		1.90	@ ....
Cobalt Oxide, black, less 100 ℔		1.96	@ ....
Green, Paris, in bulk		10	@ 10½
Green, Paris, 170 @ 175 ℔ kegs		10½	@ 11
Green, Paris, small pack.		12	@ 17
Green, Chrome, ordinary.		6	@ 12
Green, Chrom's, pure		22	@ 25
Lead, Eng., B.B. white		8½	@ 10
Lead, Amn. White, dry or in oil: Kegs, lots less than 500 ℔		7	@ 7¼
Kegs, lots 500 ℔ to 5 tons		6¾	@ 6¾
Kegs, lots 5 tons to 12 tons		6½	@ 6½
Kegs, lots 12 tons and over		6¼	@ 6½
Lead, White, in oil, 25 ℔ tin pails, add to keg price		..	@ ¼
Lead, White, in oil, 12½ ℔ tin pails, add to keg price		..	@ 1
Lead, White, in oil, 1 to 5 ℔ assorted tins, add to keg price.		..	@ 2½
Lead, Red, bbls. and ½ bbls		6	@ 7
Lead, Red, kegs		6¼	@ 7¼
Litharge, kegs		6¼	@ 7¼
Litharge, bbls. and ½ bbls		6	@ 7

Terms, &c.—Lead and Litharge.—On lots of 500 ℔ or over, 60 days' time or 2½ % discount for cash if paid within 15 days of date of invoice.

Ocher, Rochelle	1.35	@	1½
Ocher, French Washed	1½	@	2½
Ocher, German Washed	1½	@	3
Ocher, American	½	@	1½
Orange Mineral, English	8½	@	9
Orange Mineral, French	10	@	10½
Orange Mineral, German	8½	@	9
Orange Mineral, American	8½	@	8¾
Paris White, English Cliffstone	1.00	@	1.15
Paris White, American	65	@	75
Red, Indian, English	5½	@	7
Red, Indian, American	2	@	6½
Red, Turkey	9	@	14
Red, Tuscan	9	@	11
Red, Venetian, American ₩ 100 ℔	1.00	@	1.10
Red, Venetian, English	1.30	@	1.35
Sienna, Italian, Burnt and Powd. ₩ ℔	4	@	5
Sienna, Ital., Burnt Lumps.	1½	@	3½
Sienna, Ital., Raw, Powd	4½	@	5½
Sienna, Ital., Raw, Lumps	1½	@	3½
Sienna, American, Raw	1½	@	1¾
Sienna, American, Burnt and Powdered ₩ ℔	1½	@	1¾
Talc, French	..	@	1½
Talc, American	1¼	@	1¾
Terra Alba, Fr'ch, ₩ 100 ℔	95	@	1.25
Terra Alba, English	70	@	80
Terra Alba, American No. 1	65	@	75
Terra Alba, American No. 2	45	@	50
Umber, Turkey, Burnt and Powdered ₩ ℔	3½	@	4
Umber, Turkey Bnt. Ln	2½	@	3
Umber, Turkey, Raw and Powdered	3½	@	....
Umber, Turkey, R'w Lumps	2½	@	2¾
Umber, Turkey, Bnt. Amer..	1½	@	1¾
Umber, Turkey, R'w Amer.	1½	@	1¾
Yellow, Chrome	10	@	25
Vermilion, American Lead	11½	@	12
Vermilion, Quicks'er, bulk	57	@	..
Vermilion, Quicks'er, bags	58	@	..
Vermilion, Quicksilver sm'r pkgs	62	@	..
Vermilion, English Import.	85	@	90
Vermilion, Imitation, Eng..	8	@	35
Vermilion, Trieste	90	@	92½
Vermilion, Chinese	92½	@	95
Whiting Common, ₩ 100 ℔	37½	@	42½
Whiting Gilders'	45	@	55
Zinc, American, dry	₩ ℔ 4½	@	..
Zinc, French, Red Seal	7½	@	.
Zinc, French, Green Seal	9	@	..
Zinc, French, V. M. X.	..	@	7
Zinc, Antwerp, Red Seal	7½	@	..
Zinc, Antwerp, Green Seal..	7½	@	..
Zinc, German, L. Z. O	6½	@	7¼
Zinc, V. M. in Poppy Oil, G. Seal, lots of 1 ton and over	10½	@	11½
lots less than one ton	11	@	11½
Zinc, V. M. in Poppy Oil, Red Seal	..	@	..
lots of 1 ton and over	10	@	10½
lots of less than 1 ton	10½	@	10¾

Discounts.—French Zinc.—Discounts to buyers of 10 bbl. lots of one or assorted grades, 1 & 25 bbls., 2 & 50 bbls. 4%. No discount allowed on less than bbl. lots.

Colors in Oil—

Black, Drop, Frankfort	25	@	30
Black, Drop, English	12	@	15
Black, Drop, Domestic	7	@	10
Black, Lampblack, Best	20	@	35
Black, Lampblack, Common	7	@	13
Black, Ivory	8	@	15
Blue, Chinese	35	@	40
Blue, Prussian	20	@	45
Blue, Ultramarine	12	@	13
Brown, Vandyke	7	@	12
Green, Chrome	8	@	13
Green, Paris	16	@	18½
Sienna, Raw	7	@	14
Sienna, Burnt	7	@	14
Umber, Raw	7	@	10
Umber, Burnt	7	@	10

Putty—

In barrels and ½ bbls	.01½	@	.01¾
In tubs	.01¾	@	.01¾
In tin cans	.01¾	@	.02¼
In bladders	.01¾	@	.02¼

Spirits Turpentine—

In regular bbls	34½	@	..
In machine bbls	35	@	..

Glue—

Low Grade	₩ ℔ 8	@	10
Cabinet	12	@	14
Medium White	13	@	15
Extra White	17	@	20
French	10	@	22
English	10	@	15
Irish	12	@	..

SHEPARD'S
LIGHTNING
FREEZER
is what we want
It Freezes the quickest
and runs the easiest
SHEPARD HARDWARE Co
BUFFALO, N Y

Pacific Coast Representatives, CHAS. L. PIERCE & CO., 202 Market St., San Francisco, Cal.
Canadian Representative, H. D. SIMMONS, 85 York St., Toronto, Ont.

CURRENT METAL PRICES.

APRIL 5, 1893.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market report.

IRON AND STEEL—

Bar Iron from Store—

Common Iron:
¾ to 2 in. round and square.. } ₩ ℔ 1.80 @ 1.90¢
1 to 6 in. x ¾ to 1 in.... ..... }
Refined Iron:
¾ to 2 in. round and square. }
1 to 4 in. x ¾ to 1½ in.... ... } ₩ ℔ 1.90 @ 2.00¢
4¼ to 6 in. x ¾ to 1 in. .... }
1 to 6 in. x ¼ and 5-16..... ₩ ℔ 2.10 @ 2.20¢
Rods—⅝ and 11-16 round and sq. ₩ ℔ 2.00 @ 2.10¢
Bands—1 to 6 x 3-16 to No. 12.... ₩ ℔ 2.20 @ 2.30¢
"Burden Best" Iron, base price. ₩ ℔.... ....3.00¢
Burden's "H. B. & S." Iron, base price..... ..... ₩ ℔.. .....2.80¢
"Ulster"..... .... ₩ ℔.....3.00¢
Norway Bars..... ..... 3.75 @ 4.00¢
Norway Shapes... ..... 4.50 @ 5.00¢

Merchant Steel from Store—

Per ℔

Open-Hearth and Bessemer Machinery, Toe Calk, Tire and Sleigh Shoe, base price in small lots..... .. .. 2¼¢
Best Cast Steel, base price in small lots. 8 ¢
Best Cast Steel Machinery, base price in small lots .... 5 ¢

Sheet Iron from Store—

Black—

	Common American.	R. G. Cleaned American.
Nos. 10 to 16.... ...₩ ℔ 2¾ @		3½¢
17 to 20.....₩ ℔ 3 @ ...		3½¢
21 to 24.....₩ ℔ 3¼ @		3½¢
25 and 26. ...₩ ℔ 3¾ @		3¾¢
27.... .....₩ ℔ 3½ @		3½¢
28.....₩ ℔ 3¾ @		4 ¢
American B. B..... ₩ ℔ 4¢ @ 4¼¢		

Russia, Planished, &c.

Genuine Russia, according to assortment..... ₩ ℔ 12¢ @ 13¢
Patent Planished .....₩ ℔ A, 10¢; B, 9¢, 5%
Craig Polished Sheet Steel..... ₩ ℔, 8½¢

Galvanized.

	B. B.
Nos. 10 to 16..... ₩ ℔	4.20¢
17 to 22..... ₩ ℔	4½¢
23 to 24..... ₩ ℔	4¾¢
25 to 26.. ₩ ℔	5 ¢
27..... ₩ ℔	5¼¢
28.. ₩ ℔	5½¢
29 to 30..... ₩ ℔	6¼¢

English Steel from Store—

Best Cast..... ₩ ℔ 15 ¢
Extra Cast..... ₩ ℔ 16½ @ 17 ¢
Swaged, Cast..... ₩ ℔ 16 ¢
Best Double Shear ..... ₩ ℔ 15 ¢
Blister, 1st quality..... ₩ ℔ 12 ¢
German Steel, Best..... ₩ ℔ 10 ¢
2d quality.... ₩ ℔ 9 ¢
3d quality..... ₩ ℔ 8 ¢
Sheet Cast Steel, 1st quality..... ₩ ℔ 15 ¢
2d quality..... ₩ ℔ 14 ¢
3d quality..... ₩ ℔ 12½¢
R. Mushet's "Special"..... ₩ ℔ 48 ¢
" " " Annealed..... ₩ ℔ 75 ¢
" " "Titanic" ..... ₩ ℔ 20 ¢

METALS—

Tin—

Per ℔

Banca, Pigs..... 21¼¢
Straits, Pigs..... 21¼¢
Straits in Bars..... 23 ¢

Tin Plates—

Duty: 2.2¢ ₩ ℔.

Charcoal Plates—Bright—

Guaranteed Plates command special prices, according to quality. Per box.

Melyn and Calland Grade.	IC,	10	x14..	@ $6.50
" " "	IC,	12	x12..	@ 6.75
" " "	IC,	14	x20..	@ 6.50
" " "	IC,	20	x28..	@ 13.00
" " "	IX,	10	x14..	@ 8.50
" " "	IX,	12	x12..	@ 8.75
" " "	IX,	14	x20..	@ 8.50
" " "	IX,	20	x28..	@ 17.00
" " "	DC,	12½	x17..	@ 6.00
" " "	DX	12½	x17..	@ 8.00
Allaway Grade.....	IC,	10	x14..	@ 6.00
" "	IC,	12	x12..	@ 6.25
" "	IC,	14	x20..	@ 6.00
" "	IC,	20	x28..	@ 12.00
" "	IX,	10	x14..	@ 7.50
" "	IX,	12	x12..	@ 7.75
" "	IX,	14	x20..	@ 7.50
" "	IX,	20	x28..	@ 15.00
" "	DC,	12½	x17..	@ 5.50
" "	DX.	12½	x17..	@ 7.00

Coke Plates—Bright—

Steel Coke.—IC, 10 x 14, 14 x 20.. $5.50 @ $5.60
10 x 20.. .... @ 8.50
20 x 28.. 11.50 @ 12.00
IX, 10 x 14, 14 x 20.. .... @ 7.00
BV Grade.—IC, 10 x 14, 14 x 20.. .... @ 5.60

Charcoal Plates—Terne—

Guaranteed Plates command special prices according to quality.

Dean Grade.—IC, 14 x 20..... .... @ $5.65
20 x 28..... . . @ 11.00
IX, 14 x 20..... .... @ 6.40
20 x 28..... .... @ 12.80
Abecarne Grade.—IC, 14 x 20... .. @ 5.55
20 x 28.... .... @ 10 80
IX 14 x 20.... .... @ 6 40
20 x 28.... .... @ 12.80

Tin Boiler Plates—

XA, 4x 20.....112 sheets.	@	$13.35
IXX, 14 x 28.....112 sheets.....	@	14.50
IXX, 14 x 31.....112 sheets	@	16.00

American Terne Plates—Apollo.

IC, 14 x 20.....		$6.25
IC, 20 x 28.....		12.50
IX, 14 x 20.....		7.25
IX 20 x 8		14.50

Copper—

Duty: Pig, Bar and Ingot, 1¼¢; Old Copper, 1¢ ₩ ℔. Manufactured (including all articles of which Copper is a component of chief value), 35 % ad valorem.

Ingot—

Lake.. .... @ 12½¢
Ansonia grade Arizona..... .. @ 12 ¢
Ansonia grade Casting..... .. @ 11½¢

Sheet and Bolt—

Prices adopted by the Association of Copper Manufacturers of the United States, May 19, 1892. Subject to a discount of 15 % @ 25 %, according to size of order.

Not wider than	Not longer than	And longer than	Weights per sq. foot and prices per pound. Over 64 oz.	32 to 64 oz.	16 to 32 oz.	14 to 16 oz.	12 to 14 oz.	10 to 12 oz.	8 to 10 oz.	Less than 8 oz.
30	72		22	22	22	23	24	25	28	30
30		72	22	22	22	23	25	27	31	....
36	96		22	22	22	24	26	30	33	....
36		96	22	22	23	25	27	31	35	...
48	96		22	22	24	26	28	32	....	....
48		96	22	22	25	27	29	33	..	....
60	96		22	22	27	29	34	....	....	....
60		96	22	23	28	...	....	....	....	....
84	96		23	24	....	....	....	....	....	....
84		96	24	25	....	....	....	....	..	....
Ov'r 84 in. wide			25	27	....	....	....	....	....	....

Bolt Copper, ⅜ inch diameter and over, per pound..... 22¢
Circles, Segments and Pattern Sheets, 60 in. diameter and less, 3¢ ₩ ℔ advance over prices of Sheet Copper required to cut them from.
Circles, Segments and Pattern Sheets, over 60 in. diameter, up to 96 in. diameter inclusive, 4¢ ₩ ℔ advance over prices of Sheet Copper required to cut them from.
Circles, Segments and Pattern Sheets, over 96 in. diameter, 5¢ ₩ ℔ advance over prices of Sheet Copper required to cut them from.
Cold or Hard Rolled Copper 14 oz. ₩ square foot and heavier, 1¢ ₩ ℔ over the foregoing prices.
Cold or Hard Rolled Copper lighter than 14 oz. ₩ square foot, 2¢ ₩ ℔ over the foregoing prices.
All Polished Copper over 20 in. wide, 2¢ ₩ ℔ advance over the foregoing prices.

Copper Bottoms, Pits and Flats—

Per ℔.

14 ounce to square foot and heavier..... 26¢
12 ounce and up to 14 ounce to square foot... 27¢
10 ounce and up to 12 ounce..... 29¢
Lighter than 10 ounce..... 32¢
Circles less than 8 inches diameter, 2¢ ₩ ℔ additional.
Circles over 13 inches diameter are not classed as Copper Bottoms.
15 % @ 25 % discount, according to size of order.

Copper Wash Bowl Bottoms—

Tinned..... ₩ ℔ 34¢, 15% @ 25%

Tinning—

Net.

Tinning sheets on one side, 10, 12 and 14 x 48 each ..... 8¢
Tinning sheets on one side, 30 x 60 each..... 30¢
For tinning boiler sizes, 9 in. (sheets 14 in. x 60 in.), each ..... 15¢
For tinning boiler sizes, 8 in. (sheets 14 in. x 56 in.), each ..... 12¢
For tinning boiler sizes, 7 in. (sheets 14 in. x 52 in.), each..... 12¢
Tinning sheets on one side, other sizes, per square foot..... 2½¢
For tinning both sides double the above prices.

Planished Brass and Copper—

Not larger than 30 x 60.

16 oz. and heavier. ..... 24¢ ₩ ℔
14 oz..... 25¢ ₩ ℔
12 oz. ..... 27¢ ₩ ℔

Seamless Brass Tubes—

July 6, 1892. Net.

O. G.	N. G.	⅜	½	⅝	¾	⅞	1	1¼
8-14	6-12	32	28	25	24	23	22	19
15	13	33	28	26	25	24	23	20
16	14	34	29	27	26	25	24	20
17	15	36	30	28	27	26	25	21
18	16	37	31	29	27	26	25	22
19	17	38	32	30	29	28	27	24
20	18-19	39	34	32	31	30	29	26
21	20	41	36	34	33	32	31	29
22	21	43	37	35	34	33	32	31
23	22	45	39	37	36	35	34	34
24	23	48	41	39	38	36	35	36
25	24	51	44	41	40	39	38	40

Copper, Bronze and Gilding Tube, 3¢ ₩ ℔ additional

Brazed Brass Tubing. (To No. 20 inclusive.)

Above 5-16 inch to 3 inch, inclusive..... 35¢
Plain, above 3 inch..... 45¢
Plain, 5-16 inch..... 45¢
Plain, ¼ inch..... 60¢
Plain, 3-16 inch $1.00
Plain, ⅛ inch..... $1.50
Fancy Tubing, Brass, to No. 20, inclusive..... 43¢ ₩ ℔
Bronze Tubing, 3¢ ₩ ℔ more than Brass.
Discount from list..... 30 @ ..%

Roll and Sheet Brass—

(Brown & Sharpe Standard Gauge.)

Common High Brass: Wider than and including	in. 2 10	in. 10 12	in. 12 14	in. 14 16	in. 16 18	in. 18 20	in. 20 22	in. 22 24
To No. 20, inclusive	.21	.22	.23	.25	.27	.29	.31	.33
Nos. 21, 22, 23 and 24.	.22	.23	.24	.26	.28	.30	.32	.34
Nos. 25 and 26.....	.22½	.23½	.24½	.27	.29	.31	.33	.35
Nos. 27 and 28	.23	.24	.25	.28	.30	.32	.34	.36

Common High Brass: Wider than and including	in. 24 26	in. 26 28	in. 28 30	in. 30 32	in. 32 34	in. 34 36	in. 36 38	in. 38 40
To No. 20, inclusive..	.36	.39	.42	.46	.50	.55	.60	.65
Nos. 21, 22, 23 and 24	.37	.40	.43	.47	.51	.56	.61	.66
Nos. 25 and 26.....	.38	.41	.44	.48	.52	.57	.63	.71
Nos. 27 and 28.....	.39	.42	.45	.49	.53	.58	.65	.75

Discount from List 15 % to 25 %.

Brass and Copper Wire—

List January 17, 1884.

Numbered by Stubs' gauge.	Soft & hard high brass.	Spring high brass.	Low brass.	Copper.
All Nos. to No. 16, inclusive.....	$0.22	$0.24	$0.26	$0.30
No. 17 and No. 18	.23	.25	.27	.31
No. 19 and No. 20.....	.24	.26	.28	.32
No. 21, or 0.032 diameter	.25	.27	.29	.33

Discount 15 % to 25 %.

Fine Numbers.

Numbered by London gauge.	Brass.	Spring high brass.	Low brass.	Copper.
No. 22.....	$0.26	$0.28	$0.30	$0.34
No. 23.....	.28	.30	.32	.36
No. 24.....	.30	.32	.34	.38
No. 25.....	.32	.34	.36	.40
No. 26.....	.35	.37	.39	.43
No. 27.....	.38	.40	.42	.46
No. 28.....	.42	.44	.46	.51
No. 29.....	.45	.47	.49	.54
No. 30.....	.48	.50	.52	.62
No. 31.....	.51	.53	.55	.67
No. 32.....	.55	.57	.59	.73
No. 33.....	.59	.61	.63	.82
No. 34.....	.64	.66	.68	.96
No. 35.....	.70	.72	.74	1.30
No. 36.....	.76	.78	.80	1.50
No. 37.....	1.00	1.02	1.04	1.70
No. 38.....	1.30	1.32	1.34	2.00
No 39.....	2.00	2.02	.00	2.25
No. 40.....	2.60	2.6/	.60	3.75

— % discount.
Spring Wire, 2¢ ₩ ℔ advance.

Copper Belt and Hose Rivets and Burrs—

	Per ℔.		Per ℔.
No. 5.....	49¢	No. 11.....	56¢
No. 6.....	49¢	No. 12.....	58¢
No. 7.....	49¢	No. 13.....	60¢
No. 8.....	50¢	No. 14.....	65¢
No. 9.....	52¢	No. 15.....	70¢
No. 10.....	54¢		

60 % @ 5 % discount.

Tobin Bronze—Rods.

Drawn Rods for Bolts, Forgings, &c.

¼ to 3½ inches inclusive..... 17¢ ₩ ℔
Over 3½ to 5 inches inclusive..... 18¢ ₩ ℔

Piston Rods, Finished True, Smooth and Straight.

¼ to 3½ inches inclusive..... 18¢ ₩ ℔
Over 3½ to 5 inches inclusive ..... 19¢ ₩ ℔

Spelter—

Duty: Pig, Bars and Plates, $1.50 ₩ 100 ℔.
Western Spelter..... 5¢ @ 5¼¢
Bertha (pure)..... 8¢ @ 8¼¢

Zinc—

Duty: Sheet, 2½¢ ₩ ℔.
600 ℔ casks ..... 6¾¢
Per ℔..... 7 ¢

Lead—

Duty: Pig, $2 ₩ 100 ℔. Old Lead, 2¢ ₩ ℔. Pipe and Sheets, 2½¢ ₩ ℔.
American Pig..... 4.25¢
Bar ..... 4½¢
Pipe, subject to discount 20%..... 6¼¢
Tin-Lined Pipe, subject to discount 20%... ..15¢
Block Tin Pipe, subject to discount 20%.....37½¢
Sheet, subject to discount 20%..... ....7¢
Old Lead in exchange, 3½¢ ₩ ℔.

Solder—

½ @ ½ (Guaranteed)..... 13½¢ @ 15¢
No. 1 ..... 11½¢ @ 12½¢
Prices of Solder indicated by private brands vary according to composition.

Antimony—

Cookson ..... ₩ ℔ 12 ¢
Hallett's .. .. " 10¼¢@10½¢

Aluminum—

Duty: 15¢ ₩ ℔.

No. 2 grade metal, in ton lots..... ₩ ℔ .75
No. 1 (guaranteed to be 98 % pure and over), in ton lots .... ₩ ℔ .90
Lots less than 1 ton ..... 10¢ ₩ ℔ additional

Old Metals—

Prices Paid in New York.

Heavy Copper.....	₩ ℔	9½¢
Light and Tinned Copper	₩ ℔	8½¢
Heavy Brass.....	₩ ℔	7 ¢
Light Brass.....	₩ ℔	6 ¢
Lead	₩ ℔	3½¢
Tea Lead.....	₩ ℔	3½¢
Zinc	₩ ℔	2½¢
No. 1 Pewter.....	₩ ℔	14 ¢
No. 2 Pewter.....	₩ ℔	7 ¢
Wrought Scrap Iron.....	₩ gross ton	$13.00
Heavy Cast Scrap.....	₩ gross ton	9.00
Stove Plate Scrap.....	₩ gross ton	6 00
Burnt Iron.....	₩ gross ton	4.00